

INPUT CONTACT REPORT

STATE: MD DATE WRITTEN: typed 3/1/83

COMPANY: <u>GEISCO</u> NAME: <u>Jim McNerney</u> TITLE: _____ ADDRESS: _____ PHONE (301) <u>340 - 4423</u>	INPUT STAFF: (INIT.) <u>PAC/DF</u> (INIT.) _____ <input checked="" type="checkbox"/> PHONE <input checked="" type="checkbox"/> VISIT CONTACT DATE: <u>2/8/83</u>	REASON: <input checked="" type="checkbox"/> SALES <input type="checkbox"/> INTERVIEW <input type="checkbox"/> PRESENTATION <input type="checkbox"/> HOTLINE <input type="checkbox"/> SUPPORT <input type="checkbox"/> OTH: _____	RELATING TO: <input type="checkbox"/> ISIP <input type="checkbox"/> FSP <input type="checkbox"/> CAMP <input type="checkbox"/> OTM <input type="checkbox"/> ISP <input type="checkbox"/> IMP <input type="checkbox"/> CAEM <input checked="" type="checkbox"/> CUSTOM <input type="checkbox"/> OTHER ID: _____
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☐ MAIL LIST (Check all that apply)
 ☐ Client
 ☐ Prospect
 ☐ Press
 ☐ Key Contact
 ☐ Decision Maker
 ☐ Product User

DISCUSSION: This was to hopefully try and start the project on computer services
segmentation. The parameters they specifically want to cover are 1. market size.
2. competitive dynamics 3. major applications. A couple of the matrices that were
discussed are attached. We should look at the industry from the customers viewpoint.
Some areas that ~~that~~ suggest applications are as follows: logistics, including order
and transportation, resource management, including materials, money and equipment,
and required record keeping from regulatory and legal requirements. They are looking
for a new image of the industry. Some trends they are interested in are in integrated
applications and data bases. They are interested in trends in inter versus intra
company activities, trends due to legislative and regulatory change as well as demo-
graphic change, and the impact of technology are important. Other cuts relate to the
end user. These are top management, professional, operational, support, data processing,
the public (consumer), and other. This could be summarized into the professional user,

BUSINESS DEVELOPMENT POTENTIAL: _____

☒ EXTRA PAGE(S) ATTACHED

ACTION DIST	TIME REQUIRED	DESCRIBE ACTION OR FOLLOW-UP	BY WHEN	DONE	INFO DIST
Harvey		We were given some names of people to f/u			Contract
DON		with for various proposals. We should send			file
		the FPS proposal to Guy Princeparter,			
		the XTPM proposal to Galloway, who reports			
		to Ray Marshall, ISP data to Bob Hench,			
		specifications on the annual ISP report to			
		Phil Berns, personal cptr. data to Ralph Spech,			

consumer, and corporate user.

Other parameters to consider are:

1. Industry sectors served.
2. Delivery vehicle.
3. Single site versus multi site
4. National versus international
5. ? communications activity, including facilities management and intelligent networking.
6. Integration of the personal computers, including intelligent networking and computer communication ability. (very similar to the previous point.)
7. Supply versus demand of programmers.
8. Artificial intelligence.

It became very clear in the discussions that there was a necessity in defining carefully what is meant by each cell. The GEISCO people will get back to us with what they meant by each cell, including examples of applications. If they do not do so we must define it ourselves.

We agreed that we would only give U.S. data and a perspective on international or other country factors.

We agreed we would not deliver the data in ~~a-similar-~~ the same form in other reports. Obviously, we would protect GEISCO proprietary data and recommendations. We would have a planned target of \$35,000 for the study and will try and keep it under \$40,000 hopefully in the \$37,000-\$38,000 range including expenses.

ACTION: Harvey: cont.

specification on the office system studies to Phil Berns as they are developed.

GESCO MATRICES

(A)

	INTEGRATED	DISCRETE
INTEGRATED		
PROCESS		
ANALYTICAL (PROBLEM-SOLVING)		
	SINGLE SITE	MULTI- SITE (NETWORK)
		MULTI- LEVEL

(B)

BUSINESS	INTRA-ORGANIZATION		INTER-ORGANIZATION	
	SAME FUNCTION	CROS FUNCTION	SAME INDUSTRY	DIFFERENT INDUSTRY
SOURCING				
R&D				
OPERATIONS				
MARKETING				
SALES				
DISTRIBUTION				
ADMINISTRATION				
- OPERATIONS				
- CORPORATE				
INFORMATION SYSTEMS				

C

INTEGRATED DISCRETE			
ON-LINE			
PRODUCTION			
ANALYTICAL			
	SINGLE SITE	DOMESTIC MULTI-SITE	INTERNATIONAL MULTI-SITE

INPUT

ORDER/INVOICE/FULFILLMENT

ORIGINATOR (SIGNATURE) DWFPREPARED BY: DWFDATE: 9/14/84

ACTIVITY	<input type="checkbox"/> NEW ORDER	<input type="checkbox"/> FULFILLMENT ONLY	COMMISSION TO:	SOLD BY:	APPROVED
	<input checked="" type="checkbox"/> CONTINUATION	<input type="checkbox"/> SINGLE INVOICING	<u>DWF</u> <u>100</u> %	<u>DWF</u> <u>100</u> %	
	<input type="checkbox"/> CHANGE	<input checked="" type="checkbox"/> MULTI-INVOICING: <u>2</u>			INITIAL
	<input type="checkbox"/> CANCEL	NO. INVOICES			DATE
	<input type="checkbox"/> SPECIAL:	<input type="checkbox"/> PENDING:			

PRODUCT	<input type="checkbox"/> SUBSCRIPTION	US <input checked="" type="checkbox"/> UK	PROJ. ID/YEAR	TITLE OR DESCRIPTION	AMOUNT
	<input checked="" type="checkbox"/> CUSTOM		<u>YVEG</u>	<u>VANS COMPETITIVE ANALYSIS</u>	<u>\$3,900</u>
	<input type="checkbox"/> MULTICLIENT				
	<input type="checkbox"/> REPORTS				
	<input type="checkbox"/> COPIES				
	<input type="checkbox"/> CONSULT/PRESENT.				
	<input type="checkbox"/> TAPES/MATERIALS				
<input type="checkbox"/> REIMBURSED COSTS					

CLIENT AUTH. P.O. # _____ INPUT CONTRACT ☐ LETTER ☐ VERBAL ☐
ATTACH ALL AUTHORIZING DOCUMENTS TO WHITE (CONTRACT) COPY.

SHIP TO: *
NAME CHRIS DUNLAP
TITLE VAN MARKETING
COMPANY GEISCO
ADDRESS 401 N. WASHINGTON ST.
ROCKVILLE, MD. 20850
PHONE (301) 340-4960

INVOICE TO: (IF DIFFERENT)
NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
PHONE () _____

* ☐ Check here if more than one shipping address and attach names and addresses to green (fulfillment) copy. * ☐ Check here for address change to mail list.

INVOICE TO READ: (FOR OTHER THAN STANDARD WORDING)

SPECIAL INSTRUCTIONS FOR HANDLING, BILLING, STAGGERED OR DELAYED PAYMENTS, ETC.

OK TO BILL SECOND HALF OF \$17,450 plus
expenses.

O.I.F. ONLY	INV. COMP.	BY:	DATE:	CLIENT #:	ORDER #:	INV. #:	MULTI-INVOICING
							____ OF ____

ORIGINATOR/SHIPPING	FULFILLMENT	ITEM DESCRIPTION OR TITLE	NO.	BY	DATE	ITEM DESCRIPTION OR TITLE	NO.	BY	DATE

FULFILLMENT TO BE COMPLETED IN: ☐ PALO ALTO ☐ LONDON ☐ OTHER _____

• WHITE - CONTRACT • GREEN - FULFILLMENT • YELLOW - INVOICE • PINK - ORIGINATOR

• GOLDENROD - REGIONAL SALES MANAGER

R 1/81

SELECTED DATA BASE RETRIEVAL SERVICES RANKED BY CUSTOMER COUNT

<u>Company (Parent)</u>	<u>Service</u>	<u>Jan. 1, 1983</u>	<u>Jan. 1, 1982</u>	<u>Change</u>
Dow Jones Information Services (Dow Jones & Co., Inc.)	Dow Jones News/ Retrieval	60,000	30,000	100%
Quotron Systems Inc.	Financial Information Services	50,164	42,045	19.3%
CompuServe, Inc. (H&R Block, Inc.)	CompuServe Informa- tion Service	38,058	20,000	90.3%
Equifax, Inc.	Financial Control Services	27,500	23,000	19.6%
Source Telecomputing Corp. (Reader's Digest Assoc.)	The Source	26,500	14,000	89.3%
Prestel World Service (British Telecom)	Prestel	25,000	15,000	66.7%
Bunker Ramo Corp. (Allied Corp.)	Market Decision System 7, Telequote, Teletrade	25,000	30,000	-16.7%
Dialog Information Services (Lockheed Corp.)	Dialog	19,000	14,000	35.7%
Reuters, Ltd.	Monitor	13,000	10,000	30.0%
PRC Realty (Planning Research Corp.)	Multiple Listing Service	8,500	10,000	-15.0%
System Development Corp. (Burroughs Corp.)	SDC Search Service	8,000	6,000	33.3%
Commodity News Services (Knight-Ridder Newspapers, Inc.)	Commodity News Service	8,000	8,000	--
Bibliographic Retrieval Services (Thyssen-Bornemisza N.V.)	BRS	7,500	5,000	50.0%
GE Information Services (General Electric Co.)	Mark III	6,500	6,000	8.3%
I.P. Sharp Associates	Sharp APL	6,000 ¹	5,500	9.1%
Dun & Bradstreet	DunSprint	6,000	3,500	71.4%
OCLC, Inc.	OCLC	4,787 ¹	4,450	7.6%
Mead Data Central (Mead Corp.)	LEXIS/NEXIS	4,000	2,500	60.0%
National Library of Medicine	Medlars	2,700	1,800	50.0%
McGraw-Hill, Inc.	Data Resources, Inc.	2,600	1,300	100.0%
TOTALS		348,809	252,095	+38.4%

Based on company supplied information, financial reports and interviews with industry executives. Some figures are estimates. Most figures represent separately billed terminals or passwords.

¹Revised from Oct. 1 figures.





Information
Services
Company

STRATEGY DEVELOPMENT

FROM: Clee McBee

February 24, 1983

Pat Splane
D.J. Crane/Dave Foster
Harry Hooper/Ed Scully
John Neuenschwander
Jim McNerney
Paul Castaldo/Phil Berns

Attached is the illustrative example
matrix for use by INPUT in their
market segmentation study.

Thanks for your assistance.

Clee

PHONE CALL

DATE 2/25 TIME 12:10 A.M.
P.M.

Hooper

55-7933

NUMBER EXTENSION

Monday 4:30 3/2

TELEPHONED

RETURNED
YOUR CALL

PLEASE CALL

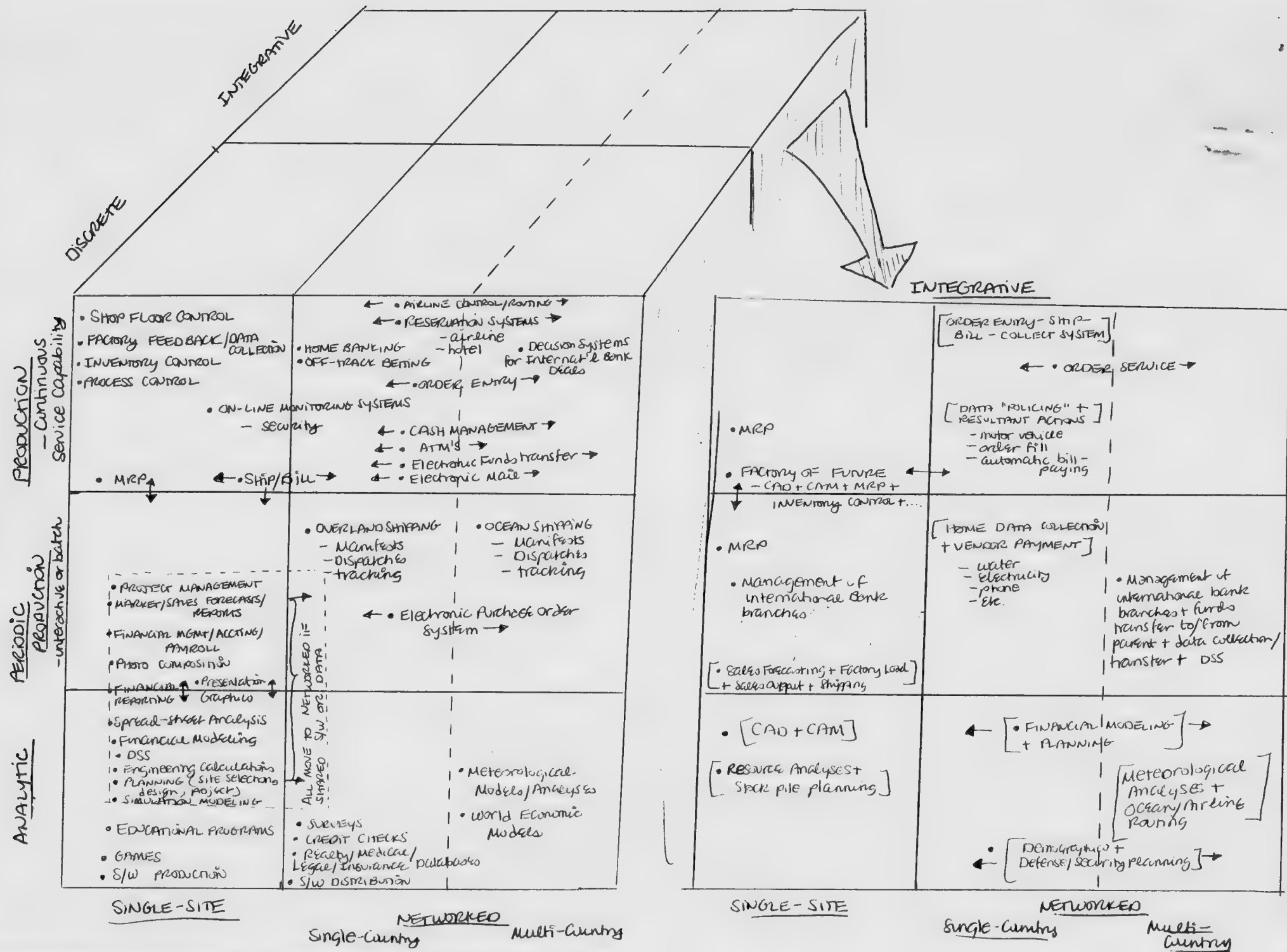
WILL CALL AGAIN

CAME
TO SEE YOU

WANTS
TO SEE YOU

TOPS FORM 4003

SUNDAY
-LV



U

PRODUCTS/SERVICES AND CUSTOMERS

02/83

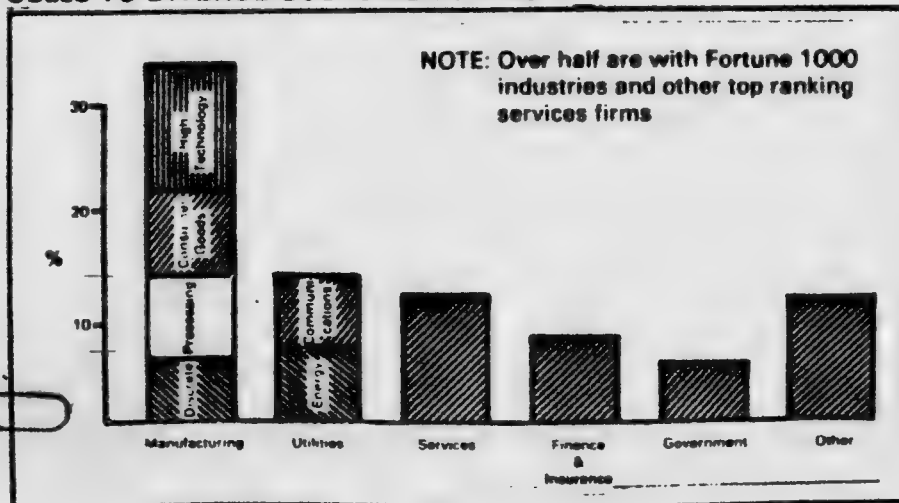
RCUR 2/26/83

GEISCO UTILIZES A WIDE RANGE OF DELIVERY VEHICLES —

MARK III (RCS)	<ul style="list-style-type: none"> Core business Major profit generator
MARK 3000 (IBM RCS)	<ul style="list-style-type: none"> End-user market focus Source of new software
DDP/ Terminal	<ul style="list-style-type: none"> Application oriented terminals Reduces costs
MINIS	<ul style="list-style-type: none"> Tied to RCS network Appeal to customer need
MICROS (IBM PC's)	<ul style="list-style-type: none"> Interface package for network Participate in user explosion
Software (NSS, Author, SI)	<ul style="list-style-type: none"> Demand is high Offensive tactic to stem in-house migration
Professional Services	<ul style="list-style-type: none"> The major value in computer services now



SELLS TO DIVERSE CUSTOMER TYPES —



AND DELIVERS SOLUTIONS INTO SELECTED VERTICAL AND FUNCTIONAL MARKETS —

	MARKET	1982 REV		SOLUTIONS OFFERED	PRODUCTS
		\$	%C		
VERTICAL	Energy 	52M	10%	<ul style="list-style-type: none"> Risk analysis Financial consolidation Well history data bases Drilling 	DAAS PETROEXS Dwight's Energy On-line PIPEFLO
	Banking 	76M	15%	<ul style="list-style-type: none"> Cash management Bond trading Bank to customer delivery 	MAX MoneyNet Global Limits Worldwide Cash Mgmt.
	Transportation 	12M	2%	<ul style="list-style-type: none"> Manifest systems Computer reporting Documentation aids 	ECS Manifest
FUNCTIONAL	Manufacturing 	180M 49%	32% 10%	<ul style="list-style-type: none"> Resource allocation Material control and inventory Production scheduling Numerical control 	MIMS CAE NC MRP
	Order Service 	42M	8%	<ul style="list-style-type: none"> Order entry Electronic processing Order flow/control 	DISPATCH 1000, 2000 EPO
	Financial Management 	85M	17%	<ul style="list-style-type: none"> Cash flow Financial consolidation Financial reporting Capital budgeting Currency management 	Accounts Payable Accounts Receivable General Ledger
	Mgmt. Reporting 	80M	16%	<ul style="list-style-type: none"> Statistical analysis and modeling Forecasting Graphics Data management 	TABOL CPL/TACTIX DSS NISAM PLOT

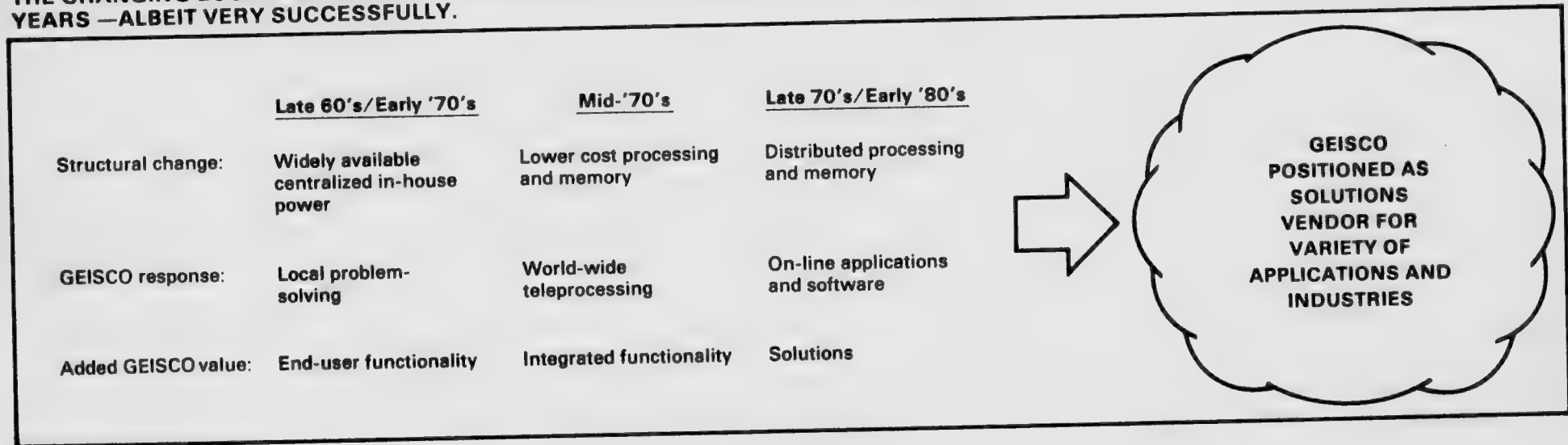
TOTAL \$507 100%
MM

12/08/82

RcvD
2/28/83

ESTABLISHING A BROADENED VIEW

THE CHANGING ECONOMICS IN DATA PROCESSING HAS FORCED GEISCO TO RESPOND TO STRUCTURAL CHANGE OVER THE YEARS —ALBEIT VERY SUCCESSFULLY.



BUT NOW GEISCO FACING DRAMATIC CHANGES IN TWO SECTORS THAT ARE BECOMING INCREASINGLY RELATED TO DATA PROCESSING —

<u>SECTORS</u>	<u>NATURE OF CHANGE</u>
Data processing	Integrating hardware software and services toward solutions
Communications	Deregulated and multiple technology driven
Information	Packaging and delivering data becoming more important than the data itself



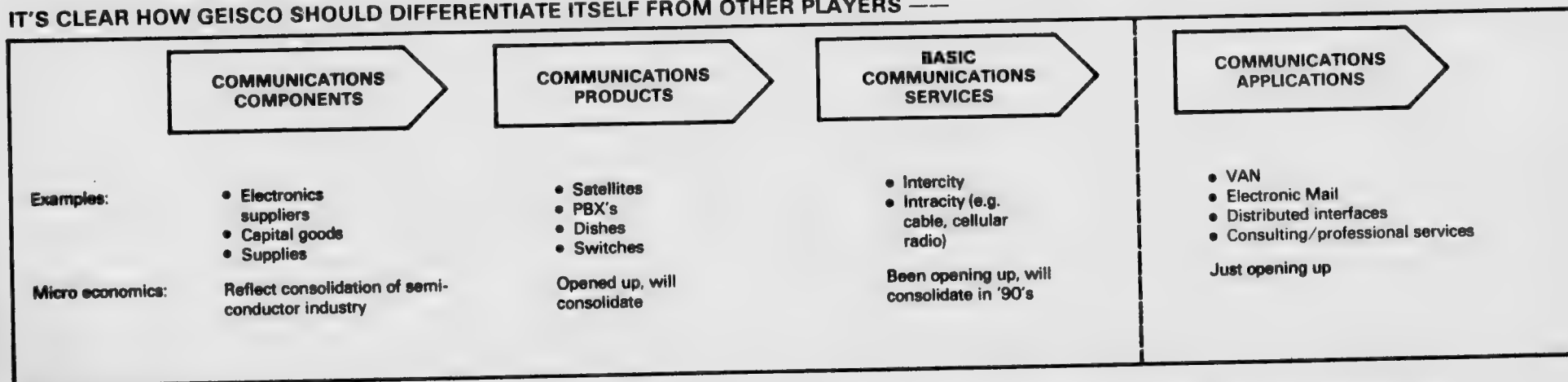
AND RATE OF CHANGE IS ACCELERATING —

We believe that these changes may represent a huge opportunity for GEISCO today:

- Share our funding in analyzing the information and communications sectors
- Discuss the implications for GEISCO strategy
- Review next steps to EB-I 1983

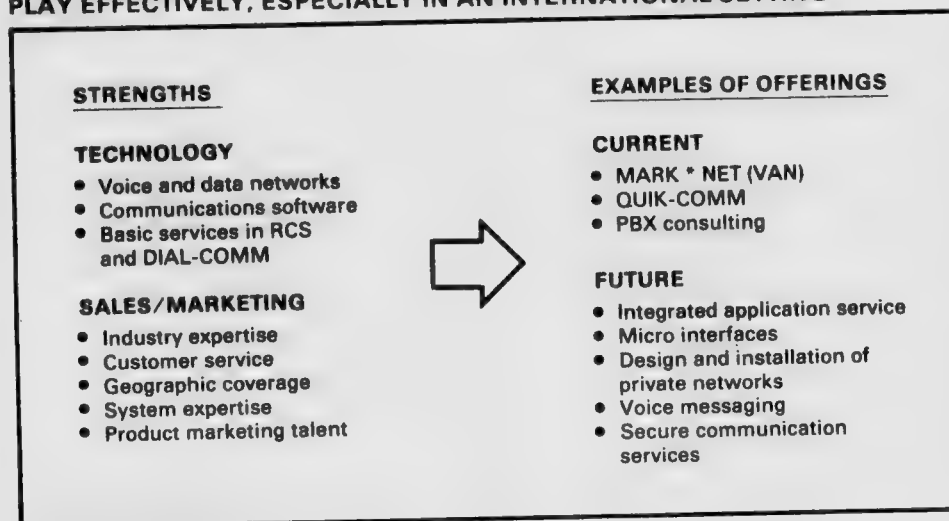
BEING BEST AT VALUE-ADDED APPLICATION GAME A REAL PLAY FOR GEISCO

IT'S CLEAR HOW GEISCO SHOULD DIFFERENTIATE ITSELF FROM OTHER PLAYERS —



OUR CURRENT STRENGTHS (INCLUDING TIPO) GIVE US THE ABILITY TO PLAY EFFECTIVELY, ESPECIALLY IN AN INTERNATIONAL SETTING —

WE CAN WIN A VALUE-ADDED GAME IF WE ACCOMPLISH THE FOLLOWING —



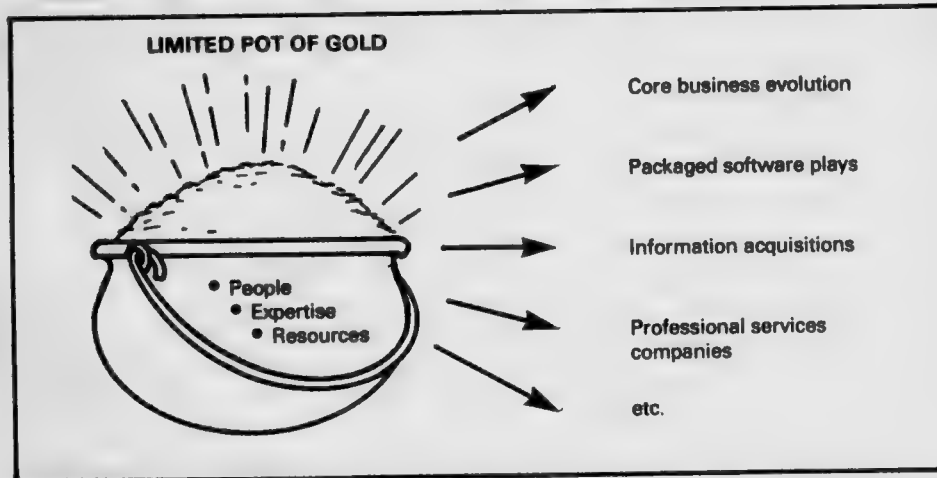
- 1 Shorten our product/service development life cycle time — quicker marketing/technology integration
- 2 Understand the correct mix of products and services that differentiates us from competition (e.g. IBM and AT&T) — balance between standard and custom approaches — what mix of professional services required
- 3 Evaluate alternative distribution approaches

CONCLUSION —

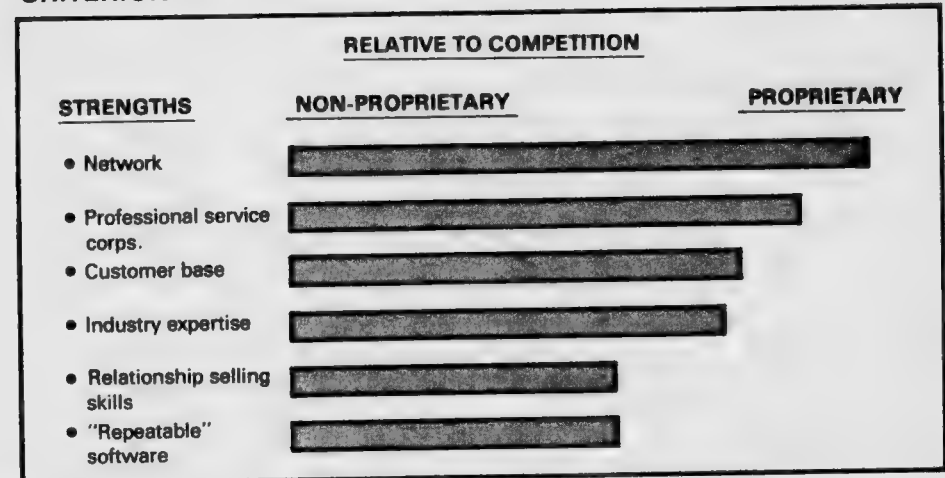
GIVEN OUR STRENGTHS, INCREASED STRATEGIC EMPHASIS REQUIRED

GOALS FOR EB-1 1983

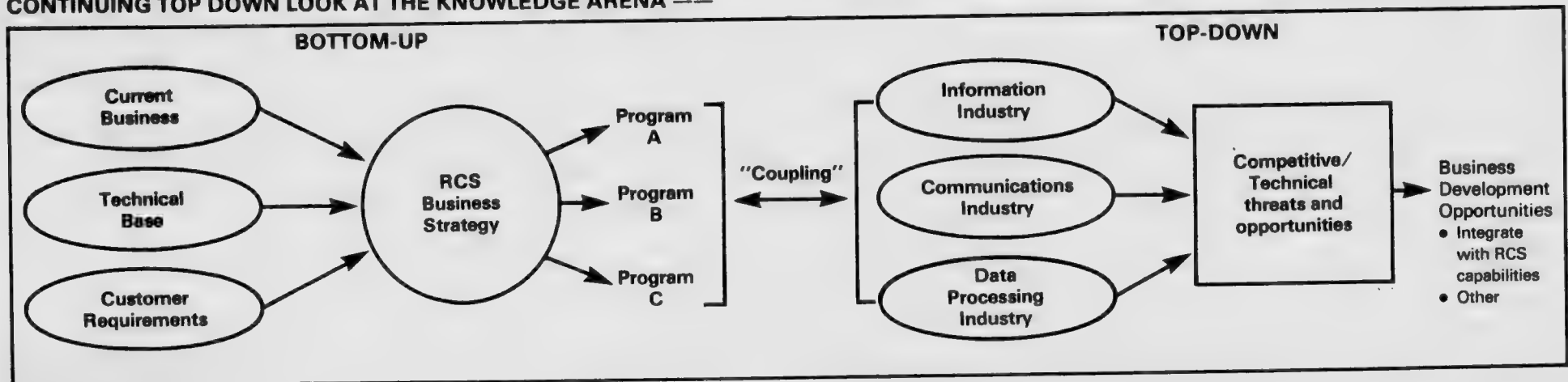
WE CLEARLY SEE MORE OPPORTUNITY THAN WE CAN HANDLE,
THEREFORE, THE ISSUE IS PRIORITIZATION AND FOCUS —



LEVERAGEABILITY OF CORE STRENGTHS WILL BE OUR TOP
CRITERION —



WE WILL BE INTEGRATING A BOTTOM-UP VIEW OF THE CHANGES OUR RCS BUSINESS MUST GO THROUGH (VIA A TASK FORCE) WITH A CONTINUING TOP DOWN LOOK AT THE KNOWLEDGE ARENA —



CONCLUSION —

WE MUST AGGRESSIVELY MANAGE THE FUTURE

LINKAGE BETWEEN GEISCO'S CORE BUSINESS AND PACKAGED SOFTWARE

THERE ARE BIG DIFFERENCES TODAY —

	PACKAGED SOFTWARE BUSINESS	GEISCO
Orientation:	Product driven	Services driven
Sales:	Short cycle, product sell "closers"	Long cycle, account management, relationship sell
Marketing:	Advertising, user groups, lead processing, documentation	TMO focus, sales support, documentation
Operations:	Product upgrade, tape distribution, documentation	Source and maintain software, large centralized "factory"



AND THE INTERSECTIONS ARE MODEST —

- Packaged software on MARK 3000 Service e.g., SI packages, System 2000, SAS
- RCS as a migration path to in-house computing — a sales tool e.g., NCSS — Nomad, MDS — Express, GEISCO — MIMS
- "Multi-level" software utilizing RCS Host and customer's on-site Micro e.g., DSS, ECS, COMSHARE — System W

BUT LEVERAGE WILL BE GREATER OVER TIME —

PACKAGED SOFTWARE SUCCESS FACTORS	IMPORTANCE			GEISCO STRENGTHS	COMMENTS/IMPLICATIONS
	'78	'82	'87		
Product development	●	●	●	●	} GEISCO can source... And integrate effectively
Product integration	●	●	●	●	
Marketing	●	●	●+	●	Our marketing skill a plus
Sales Productivity	●	●	●	●	
Pre-sales support	●	●	●	●	} Separate sales forces, but under acct. mgmt. umbrella later (?)
After-sales support	●	●	●+	●	
Image, reputation	●	●	●	●+	} Professional services a key GEISCO advantage

CONCLUSIONS —

- MARKETS OVERLAP, BUT BUSINESSES ARE SEPERATE AND DISTINCT
- THERE IS A LONG-TERM MATCH WITH GEISCO'S CURRENT STRENGTHS

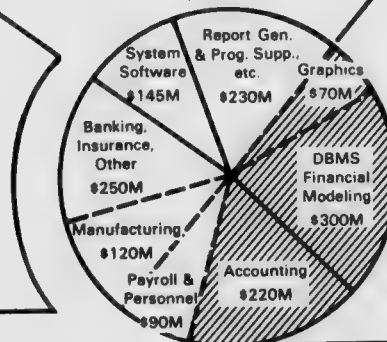
GEISCO'S PACKAGED SOFTWARE STRATEGY

STRATEGY IS DRIVEN PARTIALLY BY TMO'S ...

THE "TMO" "PLAY"

- Narrow industry focus
- Consultative sales approach
- Integrated TMO marketing strategy

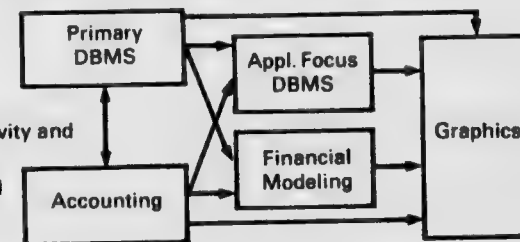
1981 INDEPENDENT PACKAGE SOFTWARE MARKET
\$1 450M



... BUT IS LARGELY A STAND-ALONE OPPORTUNITY NOW

THE STAND-ALONE PACKAGED SOFTWARE PLAY

- Cross industry application
- Large scale
- Executable productivity and linkage programs
- Position for selected integrated systems



GEISCO'S STAND-ALONE PACKAGED SOFTWARE STRATEGY IS IN FOUR PHASES

PHASE I: IDENTIFY & ACQUIRE ENTRY VEHICLE ____

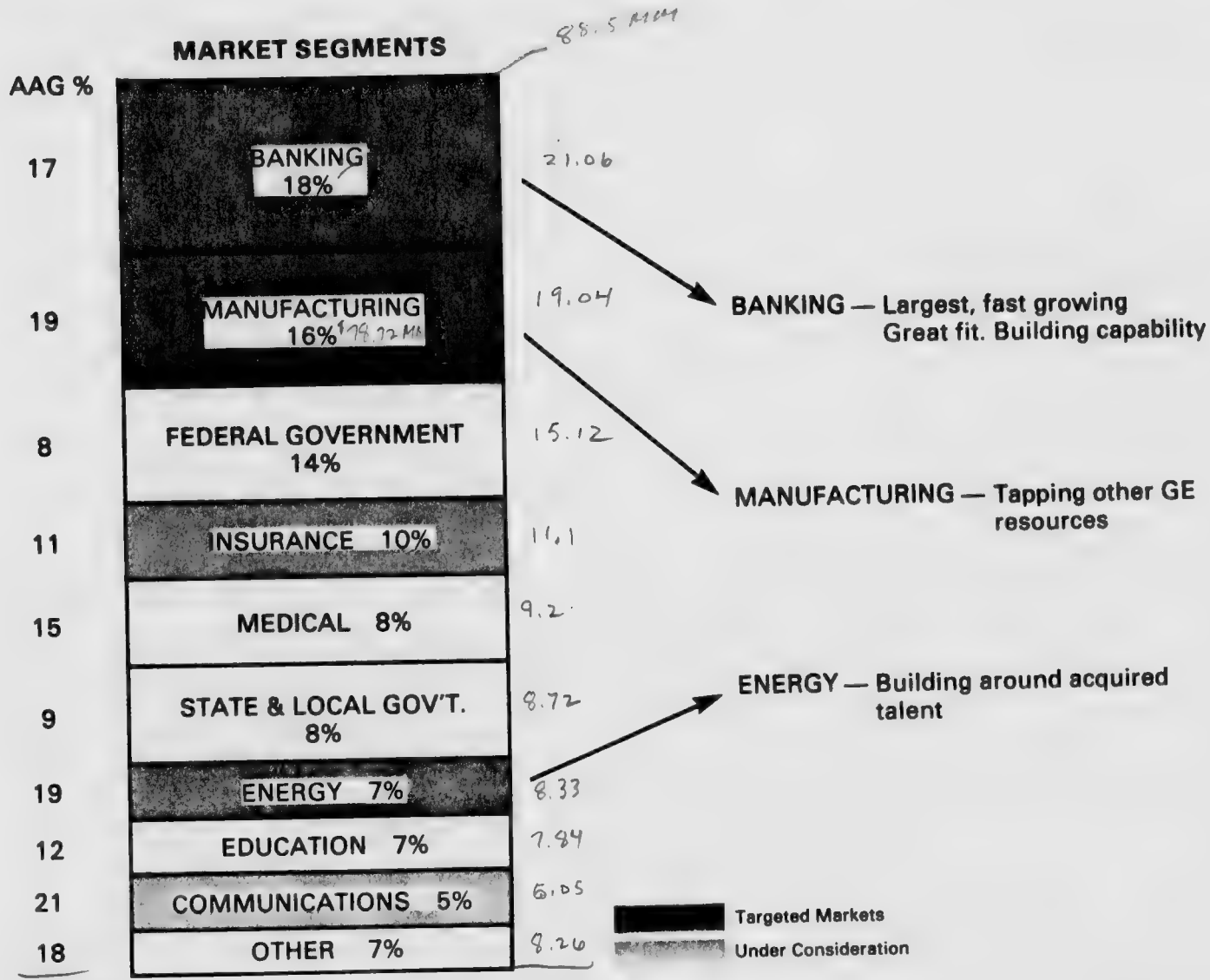
CRITERIA	ENTRY VEHICLES					THE ACCOUNTING CHOICES		
	PRIMARY DBMS	APPLICATION FOCUS DBMS	GRAPHICS	FIN. MODELING	ACCOUNT.	S.I.	M&D	MSA
Customer base	●	●	●	●	●	●	●	●
Transaction level information source	●	●	●	●	●	●	●	●
Product sales organization	●	●	●	●	●	●	●	●
Image/reputation	●	●	●	●	●	●	●	●
Not vulnerable to hardware manufacturer's forward integration	●	●	●	●	●	●	●	●
Product quality	●	●	●	●	●	●	●	●

- Primary DBMS and accounting are most attractive entry vehicles
- Accounting is the more attractive segment — primary DBMS vulnerable to forward integration from hardware manufacturers
- SI is acceptable entry vehicle due to 3000 installed General Ledger systems and strong (though small) sales organization

06/82

REV'D
2/26/83

ISSUE #6 POSITIONING IN CRITICAL TARGETED MARKETS



weightavg = 14.72%

100.0 114.72

THESE ARE GEISCO'S CRITICAL TARGETED MARKETS

ISSUE #6 POSITIONING IN TARGETED MARKETS — BANKING (Continued)

BANKING NEEDS MATCH GEISCO STRENGTHS —

MARKET SEGMENT	MARKET CHARACTERISTICS	GEISCO POSITION/COMPETITION	SUCCESS FACTORS	GEISCO PRODUCT RESPONSE
Non-Credit Services	<ul style="list-style-type: none"> • Move to fee-based services • Critical to client relationships 	<ul style="list-style-type: none"> • 75% treasurers use GE network • GE provides raw power 	<ul style="list-style-type: none"> • Innovative new offerings • Advantage to 3rd party vendor • Communications key 	Funds Transfer — Core System to wholesale services — Acquire NCI to gain quick entry Corp. Treasurers System — Automates the treasury function — Jointly develop with banks Data Exchange — Facilitates multi-bank reporting
Cash Management	<ul style="list-style-type: none"> • Intense competition 	<ul style="list-style-type: none"> • In-house option happening now and accelerating 		
Non-Credit Services	<ul style="list-style-type: none"> • Banks expanding services offered • Growing to meet multi-national corporations' needs • Less automated than domestic 	<ul style="list-style-type: none"> • GEISCO lacks proprietary S/W • Little competition, small vendors • Products don't meet emerging needs 	<ul style="list-style-type: none"> • Global consolidation of information • Integrated S/W • Communications key 	Global Limits — Global consolidation of risk exposure — MARK III provides real-time reporting Global Banking System — Integrated worldwide system for branch automation — Co-develop with international banks
International Banking				
Core Processing	<ul style="list-style-type: none"> • Biggest segment • Squeeze on profit margins • ATMS proliferating • Growth in innovative services 	<ul style="list-style-type: none"> • Historically unserved by GE • BSI MAX is 1st GEISCO entry • Myriad of suppliers 	<ul style="list-style-type: none"> • Application specific S/W • Integrated systems • Communications becoming key 	MAX — On-line processing of consumer transactions — Basis for future expansion into retail services MoneyNet — Wire transfer acquisition (NCI)

THE PAYBACK —

- New areas of revenue generation
- Moves GEISCO into bank core processing
- Builds banking expertise
- Expands delivery capabilities
- Grows customer franchise
- Positions for future opportunities

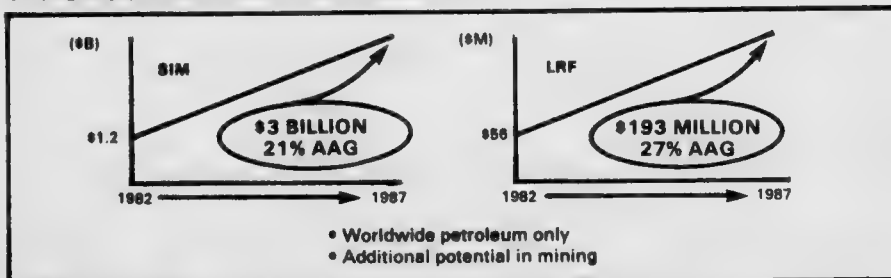
CONCLUSION —

GEISCO DEVELOPING AND ACQUIRING INDUSTRY-SPECIFIC SOFTWARE TO PENETRATE NICHES

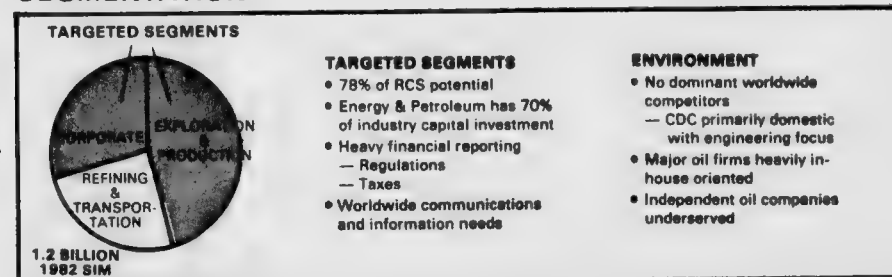
NEXT: A LOOK AT GLOBAL BANKING

ISSUE #6 POSITIONING IN TARGETED MARKETS — ENERGY

A ROBUST MARKET FOR GEISCO —



SEGMENTATION —



STRATEGY: FOCUS ON APPLICATIONS SERVING THE CORPORATE, AND EXPLORATION AND PRODUCTION SEGMENTS —

APPLICATION SEGMENT	MARKET CHARACTERISTICS	COMPETITION	GEISCO POSITION	GEISCO FOCUS
Databases <ul style="list-style-type: none"> Production Well History 	<ul style="list-style-type: none"> High drilling activity requires trend analysis Reevaluating abandoned wells High well costs demand analysis to minimize risk 	<ul style="list-style-type: none"> Boeing will offer PI's well history and production data Tymshare offers Dwight's production No competitor has full offering 	<ul style="list-style-type: none"> Dwight's Hotline Two new pricing data bases in 1982 	<ul style="list-style-type: none"> Lessen dependency on authors Acquisition candidates <ul style="list-style-type: none"> Dwight's Hotline Develop delivery system solution
Engineering Operations	<ul style="list-style-type: none"> Capital investments need to be implemented at minimum costs Sophisticated tools will sell at a premium Customers need worldwide solutions 	<ul style="list-style-type: none"> Boeing targets construction/product management UCS investing 	<ul style="list-style-type: none"> Sole supplier of drilling systems <ul style="list-style-type: none"> Arti Amoco Graphics good and improving Project management software available 	<ul style="list-style-type: none"> Offshore Business Systems <ul style="list-style-type: none"> Expand product portfolio Introduce to U.S. and Australia Develop long-term product plan
Financial Analysis	<ul style="list-style-type: none"> New drilling activity high; requires extensive analysis Customers need flexible solutions for tax and law changes 	<ul style="list-style-type: none"> Most competitors offer economic evaluation Integrated accounting not available 	<ul style="list-style-type: none"> Energy Enterprises cornerstone of strategy All major economic evaluation software available 	<ul style="list-style-type: none"> Integrated Accounting Expand Energy Enterprises' products for Europe, Canada, Australia

MARKET RESULTS —

- Market presence
- Focused product line
- Improved growth potential

CONCLUSIONS —

- ENERGY MARKET REPRESENTS A MAJOR GROWTH OPPORTUNITY FOR GEISCO
- GEISCO POSITIONED WELL, BUT SMALL SHARE

INPUT

1943 LANDINGS DRIVE, MOUNTAIN VIEW, CA 94043

(415) 960-3990

February 16, 1983

Mr. W. James McNerney, Jr.
Vice President
GEISCO
401 N. Washington Street
Rockville, MD 20850

Dear Jim:

Thank you for the confidence you are placing in us with our involvement in your planning process. The "Market Segmentation Study" is a challenging project to say the least.

Attached is a revised proposal. Please let us have your formal approval so we have documentation on the project. Please note that there is not a "front-end" payment as we normally require on consulting assignments - so we would appreciate your prompt payment of invoices as they are submitted.

I appreciate your concern over confidentiality. However, data are data and you appreciate that the data we will use come from our other research. The exact method of data organization will probably not be duplicated in any one report: however, you can expect to see similar organizational subsets being reported over the next few years. This is simply because the concerns and trends we are examining are present in the industry as a whole and are not limited to GEISCO.

Obviously, proprietary data from GEISCO will be treated as confidential - although we have not had any given to us as yet. Again, please note that we do analyze GEISCO periodically for our Company Analysis and Monitoring Program. However, the function is separate within our company and we will ensure confidential data is not transferred.

Finally, we are always concerned about working with a committee with the vested interests inherent in such a structure. You are INPUT's client for this project. The other GEISCO team members have a working role on the project as a whole but are ancillary to INPUT's project.

We feel regular meetings are necessary in this regard to avoid getting "sand-bagged" later. It will be important to summarize the status directly with you after each meeting.

Thank you again for this opportunity to work with you.

Yours sincerely,



Peter A. Cunningham
President

PAC:am

Enclosures

PROPOSAL

TO

GENERAL ELECTRIC INFORMATION SERVICES COMPANY

FOR A

MARKET SEGMENTATION STUDY

FROM

INPUT

FEBRUARY 15, 1983

INPUT

MARKET SEGMENTATION STUDY

OBJECTIVE

- Segment the market for GEISCO's business in 1983.
- Forecast the development of these market segments through 1987, including market erosion and new market growth.

SCOPE AND METHOD

- The scope of the project will cover the U.S. information services market, excluding systems software products. INPUT will provide perspectives on the international market, if possible, based on time constraints and data availability.
- The data provided will be for 1982 and forecasts for 1987.
- The project will start with a meeting at GEISCO. This meeting will be to develop the preliminary segmentation of GEISCO's business based on the work already performed. This segmentation will be at two levels.
 - Macro level which will consist of a simple matrix.
 - Micro level where each of the cells in the macro matrix will be broken down into component parts. The component cells will cover type of service: processing services, integrated systems, application software products, and professional services.

- In this meeting, INPUT and GEISCO staff will discuss the cells in terms of GEISCO's data, business and any thoughts on the markets in those segments.
- This meeting is scheduled for February 18, 1983.
- Following this meeting, INPUT analysts will:
 - Finalize the segmentations to take account of practical constraints of time and data availability.
 - Define and describe the characteristics of each identified market segment.
 - Quantify the segments in terms of 1982 market data.
- This process will depend on the data that INPUT has in its files.
- This process is expected to occupy four weeks from the initial meeting. The INPUT analyst assigned will meet with the GEISCO team in Washington to discuss progress on Friday morning, March 4 at 10:00 a.m.
- The progress meetings will consist of two parts:
 - A team meeting to discuss data.
 - A one-on-one meeting with Mr. McNerney to review and agree progress.
- On completion of the analysis, Peter Cunningham and the INPUT analyst will meet with GEISCO to review the segmentation. This meeting is scheduled for March 18 at 10:00 a.m.
- Following the segmentation, INPUT will develop forecasts for segment performance through 1987.

- This will include predictions of the lost business in each segment.
- Growth in existing segments will be analyzed.
- Growth in new or emerging segments will also be forecast.
- As well as the market forecast, analysis of the competitive dynamics in each segment will be made.
- This process is expected to occupy three weeks. The INPUT analyst assigned will meet with the GEISCO team in Washington to discuss progress on Friday, April 1 at 10:00 a.m.
- The final meeting will be to review the results of the study. This meeting will be attended by Peter Cunningham and the analyst involved. At this meeting, INPUT will deliver for each segment analyzed, tables showing the market migration, losses and growth: a commentary on the competitive environment, and a description of the characteristics of the segment.

SCHEDULE AND FEE

- The suggested schedule is as follows:
 - Initial meeting: February 18.
 - Intermediate meeting to discuss the market segmentation and analysis: March 18.
 - Final meeting to discuss the market segmentation forecast and conditions: April 15.
- The fee for the project is based on Peter Cunningham's involvement in the three major meetings and also in working with the analyst. Mr. Cunningham's

rate per day is \$1,500 and he is expected to put 5 days in this project. The project will not be billed for the time spent in Mr. Cunningham's travel to and from the West Coast. Expenses for his travel, however, will be billed.

- The analyst involved will be charged to the project at the rate of \$1,200 per day. The actual number of days expended will depend on the number of segments to be analyzed. It is expected that this level of involvement will be approximately 23 days.
- The analyst will be Mr. Don Fostle who is based in the East Coast office.
- The total fee for the project will be in the range of \$35,000, plus out-of-pocket expenses for travel, telephone, etc.
- This project will be performed for GEISCO on a time and materials basis.
- Invoices will be submitted monthly. Prompt payment is requested.

AUTHORIZED BY:
GEISCO

ACCEPTED BY:
INPUT

NAME

NAME

TITLE

TITLE

DATE

DATE

INPUT

1943 LANDINGS DRIVE, MOUNTAIN VIEW, CA 94043

(415) 960-3990

NS
proposal
file

January 27, 1983

Mr. W. James McNerney, Jr.
Vice President
GEISCO
401 N. Washington Street
Rockville, MD 20850

Dear Jim:

I really enjoyed our meeting on Friday. I believe we can be of assistance to you in developing your plans for GEISCO.

Attached to this letter is a proposal to assist in the market structuring that we discussed during our meeting. Essentially, I would be involved in the beginning of the project, at stages during its development and during the final presentation to you.

I hope we will be able to continue the existing subscription programs for you this year. These provide the basis of the research and the information without which we would not be able to do the projects such as that proposed in the attachment. Please let us have the support in renewing the Information Services Industry Program and the Company Analysis and Monitoring Program for 1983. I have enclosed a copy of their descriptions and the price for your consideration as well. *

Please call me, Jim, if there is any way I can personally be of assistance. I very much look forward to working with you.

Yours sincerely,



Peter A. Cunningham
President

PAC:am

Enclosure

P.S. I look forward to seeing you on Tuesday/PAC.

* The combined fee for the two programs is \$23,000

DRAFT
PROPOSAL

TO

GENERAL ELECTRIC INFORMATION SERVICES COMPANY

FOR A

MARKET SEGMENTATION STUDY

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INPUT

FEBRUARY 3, 1983

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OBJECTIVE

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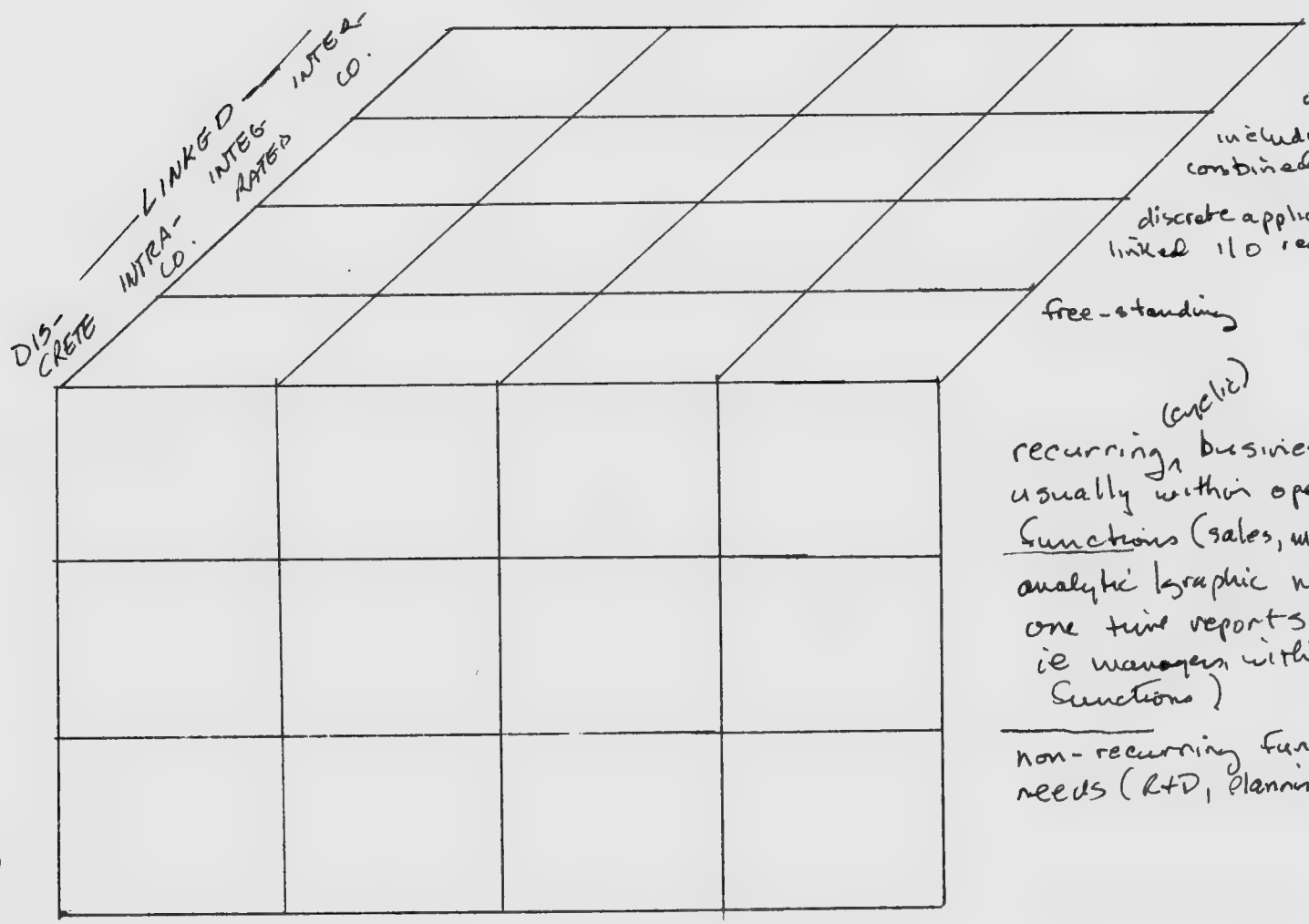
SCOPE AND METHOD

- The project will start with a meeting at GEISCO. This meeting is expected to take two days and be attended by Peter Cunningham and the INPUT analyst assigned to the project. The purpose of this meeting will be to develop the segmentation of GEISCO's business based on the work already performed. This segmentation will be at two levels.
 - Macro level which will consist of relatively simple matrices.
 - Micro level where each of the cells in the macro matrices will be broken down into component parts. However, the total number of component parts should not exceed 25.
- In this meeting, INPUT and GEISCO staff will discuss the cells in terms of GEISCO's data, business and any thoughts on the markets in those segments.
- Following this meeting, INPUT analysts will quantify the segments identified in terms of 1982 market data. Each segment will be described and the characteristics of the markets identified. Some commentary will be developed on competition in the segments.

- This process will depend on the data that INPUT has in its files.
- This process is expected to occupy four weeks from the initial meeting. Each week the INPUT analystss assigned will spend one day with GEISCO in Washington to discuss progress.
- On completion of the analysis, Peter Cunningham and the INPUT analyst will meet with GEISCO to review the segmentation.
- Following the segmentation, INPUT will develop forecasts for segment performance through 1987.
 - This will include predictions of the lost business in each segment.
 - Growth in existing segments will be analyzed.
 - Growth in new or emerging segments will also be forecast.
- As well as the market forecast, predictions of competitive activities in each segment will be made. There will be a discussion of the requirements for success in each segment.
- This process is expected to occupy three weeks and again INPUT will meet with GEISCO each week.
- The final meeting will be to review the results of the study. This meeting will be expected to occupy two days and to be attended by Peter Cunningham and the analyst involved. At this meeting, INPUT will deliver for each segment analyzed, tables showing the market migration, losses and growth: a commentary on the competitive environment, and a description of the characteristics and requirements of the segment.

SCHEDULE AND FEE

- The suggested schedule is as follows:
 - Initial meeting the week of February 18.
 - Intermediate meeting to discuss the market segmentation and analysis the week of March 18.
 - Final meeting to discuss the market segmentation forecast and conditions the week of April 15.
- The fee for the project is based on Peter Cunningham's involvement in the three major meetings and also in working with the analyst. Mr. Cunningham's rate per day is \$1,500 and he is expected to put 8 days in this project. The project will not be billed for the time spent in Mr. Cunningham's travel to and from the West Coast. Expenses for his travel, however, will be billed.
- The analyst involved will be charged to the project at the rate of \$1,200 per day. The actual number of days expended will depend on the number of segments to be analyzed. It is expected that this level of involvement will be approximately 28 days.
- The analyst will be based in the East Coast office.
- The total fee for the project is likely to be in the range of \$44,000, plus out-of-pocket expenses for travel, telephone, etc.
- This project can be performed for GEISCO on either a time and materials or a fixed price basis.



PROCESS
(OPERATIONAL)

MANAGEMENT
CONTROL

ANALYTIC
(PROBLEM SOLVING)

SINGLE-SITE

MULTI-SITE

NETWORKED

DIS-
CRETE

INTRA-
CO.

LINKED
INTRA-
CO.

INTEG-
RATED

INTER-
CO.

free-standing

example:
inhouse host-to-
outside host

includes separate and
combined applications

discrete applications with
linked I/O requirements

(cyclic)

recurring business need
usually within operational
functions (sales, mktg, mfg, etc)

analytic/graphic non-repetitive
one time reports (individuals,
ie managers within all
functions)

non-recurring functional
needs (R&D, planning, others)

Definitions



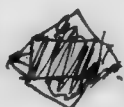
(415) 854-1491

Develop definitions - 18th
PLANNING ON FRIDAY

Write - Statement
10th 0'clock
once a week - 2-3 hrs

+ Define what level is doable +

44 - →
\$35k + expenses

Develop definitions  → assume definition

- McNerney is the client -



FINALIZE DEFINITION OF OUTPUT
KICK-OFF ON PROJECT

GROUP IS ADVISORY
COMMITTEE



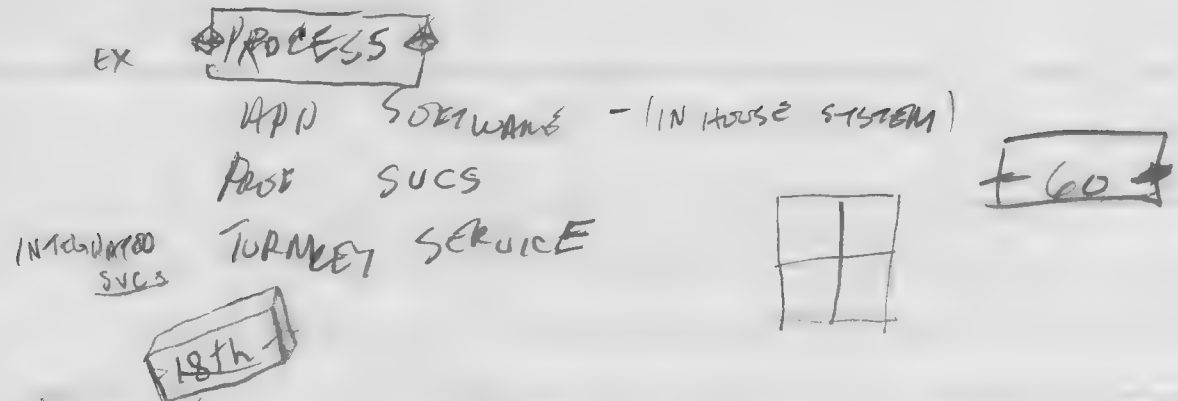
27 days

- KICK OFF
- FEB 18th FINALIZE DEFINITION OF OUTPUT
- FEB 23 INPUT RESPONSE TO DEFINITION OF GEISLO
- W/ SPECIFICS
- FEB 28 - GEISLO EXPLANATION RESPONSE
- MAR 3 INPUT STARTS MATRIX ASSEMBLY
- MAR 7/8 [CAL. DATA HUNT]
- MAR 14 BIG SLICE TENTATIVE OUTER TOTALS
- MAR 18 - PRESENTATION
- MAR 21 BREAKOUT OF 3 KEY CELLS -
- MAR 28 BREAKOUT OF 3 KEY CELLS -
- APR 4 PARSE INTO DISCRETE/INTEGRATED -
- APRIL 11 FINAL PRESENTATION

1	
2	3
1	4
2	6
2	8
5	13
1	14
3	16
3	19
5	24
3	27

1982 DATA BY 18th of March

DEFINITION BY HERE



4th spin 8th

6 DAYS PAC

4th | MIXON

18

-25-

18+1

4th

1 APRIL

-8- 11

15 11 PRESENTATION

6 March

APRIL 1

APRIL 15

270 → 495 is 3 lanes

~ 4 miles on 495

pass Rock Road

" Card Rock Springs

Cross River Radar Detector sign

Right exit to Wash Memorial Pkwy

8-10 miles (Eastward) (2 wide)

Sharp left curve traffic entering from right
left lane

Keybridge

Memorial Bridge

Under a bridge onto extension of 14th St

pass exit for 14th St bridge

Two right lanes

FEB 11 1983

David F. Foster, Mgr., MARK III Program 4201
Paul Castaldo, Mgr., Venture Marketing 4725
Phil Berns, Mgr. Market Research 4336
Clee McBee, Mgr. Strategy Development 340 4482

(301)

Peter - the above are the people (except for Castaldo) who sat in the meeting yesterday, per your request. Jim forgot to give it to you.

Felicity
2/9/83

✓ cc: Don Fostle, NJ

National Airport

TO

George Washington Pkwy (395)

2 miles Parkway keep right

Parkway hotel 8-10 miles

Beltway Maryland at 495 to Silver Spring
to VIRGINIA (with BACK)

270 Key left to Annapolis 6-7 miles

EXIT 2nd Annapolis to Rt 28 left

3rd light turn left, follow to end

401 North Washington turn left to NW

3 blocks on right

continued...

GE/SCO 2/8/83



What is the maximum value for the signal?

Since the signal is...

The signal is a function of time...

- ① Period of the signal is...
- ② Amplitude of the signal is...
- ③ Phase of the signal is...
- ④ Frequency of the signal is...
- ⑤ Wavelength of the signal is...
- ⑥ Velocity of the signal is...

GEISCO 2/8/83

MARK SIZE & GROWTH

COMPETITORS

MARKETS EACH SEGMENT

WHO WILL WIN WHERE & WHY

- distribution
- logistics - order serv. transportation
- no direct input < ^{requirement} management
- intra company processing

Data Functions

Surveying R&D OPERATIONS MARKETS SALES DISTRIBUTION ADMIN

MARKETS

- sales function
- cross function

MARKETS

SALES INC

0.5.2

CROSS INC

CASE INC

- ① Under stand ^{discrete} integrated systems trends
- ② " intra & inter company trends

③ Database

④ Legislative / Regulatory

⑤ Professional

⑥ Consumer

⑦ Sector view Agriculture; Mining, (SICs).

⑧ Delivery vehicle

⑨ Single vs multi site

⑩ Subnational vs National

End user TYPES

Professional

Corporate

Consumer

1.2.1.1 MARKETS 7

END USER CATEGORY

GESCO 2/8/23

PROFESSIONAL & CONSUMER

OR PERSONNEL

ROBUST & ROBUST

100%

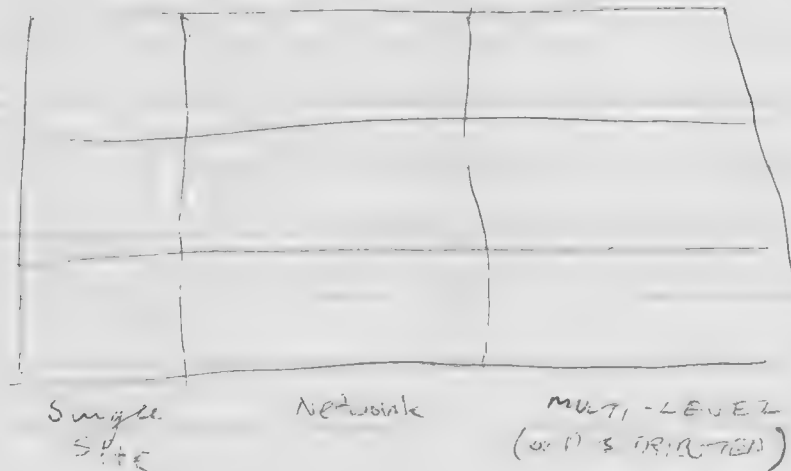
Write Professional & consumer theories

- ① Demand for computer, common software
- ② Price comparison
- ③ Supply & Demand of software

Integrative

Process

PROBLEM SOLVING



Custom & Res. system

SALES INFORMATION SUMMARY

MARK III®
Service

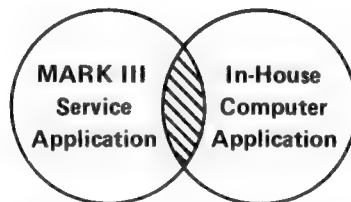
Integrated Applications Service

November
1982

OVERVIEW

What Is Integrated Applications Service?

Integrated Applications Service (IAS) is a new concept for processing computer applications by sharing the resources of GE Information Services (GEISCO) MARK III Service with the resources of a customer's in-house computer. The computing resources of the two host systems



are interactively coupled to do real-time processing that combines the best features of the customer's host system with those of MARK III Service. The result is greater efficiency and improved cost effectiveness for large distributed processing applications.

Why IAS Is Important

More Communications Orientation

STIMULUS

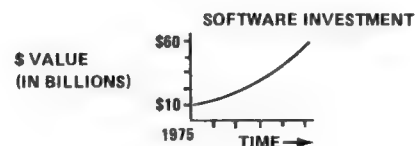
- HIGH INTEREST RATES
- INTERNATIONAL OPERATIONS
- SLOW MAIL SERVICE
- INCREASING LABOR COSTS
- INCREASING LINE COSTS

ALTERNATIVES

- MANY SUPPLIERS & SERVICES
- DE-REGULATION
- TECHNOLOGICAL CHANGES
- STANDARDIZED APPROACHES
- STAND-ALONE NETWORKS
- PDN SUBSCRIPTIONS

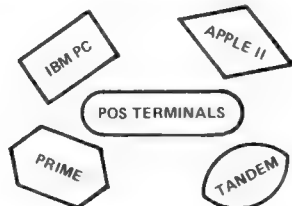
Business conditions are stimulating more interest in the communications aspect of applications, and there are a greater variety of communications alternatives to choose from.

Protection of Software Investment



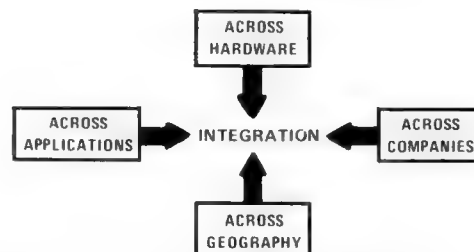
Companies want to protect their tremendous investment in installed software as the cost of software becomes a larger proportion of EDP expenditures.

Innovations in Hardware Technology



An ever expanding array of micros, minis, and terminals are fragmenting data processing and making it more difficult to maintain control of distributed data processing.

Need for Integration



There is a pressing need to integrate business operations in several dimensions, yet still provide greater access to data by end users.

THE OPPORTUNITY

Is It Real?

- We have existing customers, plus pipeline prospects.
- American Bell is positioning themselves in this market, and they project \$90 million in revenue by 1984.
- Depending on application requirements, IAS can provide a superior capability that includes computing which can't be duplicated by a Value Added Network (VAN).

Is It Possible To Win?

- We have the technology in place right now.
- We know the applications, not just the hardware and communications; and SDC has actual installations.
- LTI is equipped to address in house integration needs.
- Our control of MARK III system software facilitates integration.

Is It Worth It?

- The hits we get are big ones.
- The margins on this type of business make it attractive.
- It's an opportunity to build better relationships with data processing managers.
- We need capabilities such as this to revitalize our competitive edge in the RCS business.

Is The Time Ripe?

- In the short term, with existing technology, we can focus on shared applications to get big dollars quickly.
- In the long term, our activities are 100% consistent with our positioning as a systems integrator.

Is It Right?

- **For the customer?**
 - Integration across hardware is an increasing need.
 - Integration frequently requires application level processing.
 - Communications and teleprocessing have high initial costs and require a depth of knowledge.
 - There is currently a high level of interest in the customer population.
- **For GEISCO and you?**
 - Lack of in house integration is a key RCS sales obstacle which IAS can help overcome.
 - Shared processing can optimize costs for the customer, and we can participate in the action.
 - We offer a full range of alternatives to satisfy a variety of needs.
 - IAS allows you to actively involve DP as well as functional managers in new applications.

SALES CONSIDERATIONS

Risks

— — — and — — —

Precautions

- Sales cycles are usually long Get started now while competitors are still talking "futures."
- Large investment of sales effort in each opportunity Qualify the prospect carefully before committing a lot of resources.
- Implementation process is complex Monitor closely, and control the total situation.
- International regulation Emphasize the MARK III processing involved.

When Not To Sell IAS

It is inappropriate to sell IAS when:

- The application is so highly communications oriented that it is predominately message switching
- A single transaction has an extremely high volume of data (more than 10,000 characters)
- Something other than asynchronous transmission is absolutely required
- Unusual protocol conversion which cannot be handled at the application level
- Devices that require character-by-character echo
- Long leadtime is required in systems engineering to implement special features
- Dial-Out is required to points outside the continental U.S.A.

Sales Support

- Hin Szeto (8*273-4298), a full-time Project Manager, heads a cross-functional support team to assist you in qualifying prospects, proposal development and review, problem escalation and resolution.
- A headquarters sales component will assist you in evaluating major opportunities and provide direct assistance throughout the sales cycle.
- SDC and LTI will assist in reviewing opportunities and preparing proposals.
- Client Services Organization offers a dedicated support contract
- SDC offers a maintenance contract
- A sales promotion brochure available in early 1983
- A Technical Guide available in early 1983
- An IAS technical training course available in early 1983

PROSPECTING

Targets

- **Data processing manager** — undoubtedly a key factor in any decision
- **Communications manager** — responsible for line costs and sure to become involved
- **Functional managers** — especially those responsible for large, high-value data bases with a requirement for distributed data processing or international access
- **Authors or resellers** — may welcome an opportunity to improve the sale or use of their software

Action

- Become familiar with IAS.
- Review known applications on MARK III Service or in-house computers and compare them against qualification criteria for possibilities.
- Explore new opportunities with targeted individuals.
- Call on headquarters people to develop your opportunities and help close the sale.

Strategy

- **Offensive:** Expand existing applications cost-effectively — grow the account.
- **Defensive:** Shift some processing cost to the in-house system in order to retain a portion of an application in jeopardy.
- **New business:** sell customized solutions
 - Start with communications and limited processing.
 - Grow the application to more extensive processing.

In any case, emphasize the range of possible alternatives, GE Information Services' partnership with in-house MIS, and how this approach can avoid high risk alternatives of a do-it-yourself approach using several vendors and help to control costs.

Qualification Parameters

- Connect time requirements
- Volume of transactions from remote sites
- Length of each transaction
- Response time requirements
- Reliability requirements
- Functionality needed
- Location of remote access points
- International orientation
- Asynchronous front end on in-house system
- Projected line costs rising rapidly
- If a VAN or leased line is a cost-effective substitute, this is not an IAS application

QUESTIONS & ANSWERS

Q: Is there such a thing as a standard or typical IAS system?

A: No. All IAS systems are customized installations.

Q: Who implements and supports an IAS system?

A: GE Information Services Company handles the complete job. TP application programs and the communications interface with the in-house system are implemented by a special team from SDC. Headquarters coordinates any special arrangements required. Installation of software on the in-house system can be handled by LTI specialists. And under a maintenance contract the SDC implementation team will initially handle customer support. But this responsibility will be transferred as soon as possible to local SDC personnel.

Q: How does IAS differ from inter-processing using DSXMIT?

A: DSXMIT is an intermittent batch mode means of communicating with MARK III Service via High-Speed Service in discrete sessions using synchronous channels, with the user having to initiate the dial-in session. IAS is an interactive connection using an asynchronous communications channel. IAS also provides MARK III program control over the operational procedure.

Q: Can IAS be used with Dial-Out internationally?

A: No. International restraints on Dial-Out still apply and it can only be used in the continental U.S.A.

Q: How does IAS differ from a Value Added Network (VAN)?

A: The purpose of a VAN is to provide a communications link between a terminal and a remote host computer with code and speed conversion. IAS is interactive and embodies processing and data base capabilities and does not support terminal-to-terminal traffic, or terminal-to-computer traffic without any processing.

Q: When accessing an in house system using IAS how is response time affected?

A: Response time is a few seconds (3-5) longer compared to accessing the in-house system directly via a menu selection process.

Q: What do I do if I think I have a prospect?

A: Call the MARK III Program Office to discuss the situation and seek clarification about whether to proceed.

Q: What are some typical applications in our various targeted markets?

A: There are a number of areas where we already have some activity and experience. In *Financial Services* banking has potential, particularly cash management. In *Order Service* order entry and inventory control. In *Energy and Transportation* petroleum marketing has potential with a focus on sales reporting. And in *General Business* project management of major large construction projects is a strong candidate.

NEEDS VS. SOLUTIONS

If a prospect is faced with. . .	And needs. . .	Then IAS may be the solution because it provides . . .
• Dispersed worldwide operations	• International accessibility	• The GEISCO network
• Programming backlog	• Rapid implementation of systems	• People to develop applications software
• Loaded mainframe computer	• Place to off-load some jobs	• Virtually unlimited capacity
• Proliferation of remote devices	• Capability to tie devices together	• Common interface to remotes
• Port contention on in house system	• Greater access to on-line data/programs	• Shared data bases/processing
• High investment in applications software	• An alternative to rewriting programs	• Flexible add-on capability
• Users with several terminals to talk to different host computers	• One terminal to do the job of many	• Common interface to multiple systems
• Applications and data spread all over	• More controlled operations	• Integrated processing
• A wide choice of technical solutions	• A way to take advantage of what's available	• All the capabilities needed from a single vendor*
• Efficient in-house processing	• A means to keep things operating smoothly	• Shared processing, store and forward
• Existing in-house data bases that are not being fully used	• End user access to data bases	• MARK III front-end system
• An on-line production system that supports a vital business function	• Assurance that the system will meet operational requirements	• High reliability
• Remote micros/minis that don't talk to any host system	• Control of dispersed and uncoordinated processing	• Network accessibility, terminal compatibility, protocol translation options, MARK III host processor, or connection to in-house host
• Growing need for additional applications or capabilities	• A way to help hold the line on costs and avoid large investment	• A modular expansion
• Efficient MARK III on-line applications	• Access to in-house data base, or in-house batch processing efficiencies	• An opportunity to take advantage of the best of both systems

* MARK III host system, mini/micro/terminal hardware, worldwide network, customized applications software, people to design and implement, computer-to-computer technology.

SERVICE CONCEPTS

How IAS Works

Remote users access the MARK III Network in a normal manner and log on to a MARK III Foreground Transaction Processing application program. They can generate transactions that use a MARK III data base, and/or require access to an in-house host system. To handle the latter transactions, the TP program is customized to communicate with asynchronous front end ports on the in-house system in one of three ways: direct connection, via a MARKLINK Terminal or via a mini remote concentrator.

The communications channel used for a given application depends on the volume of transactions, the response time requirements, and other functionality desired. The number of simultaneous connections to the in-house system is subject to several limitations, including the number of dedicated ports on the in-house system.

Software must be present on the in-house system so that it can establish its identity to the MARK III system at connection time, and to interface with the communications system. This software can be supplied and installed by GE Information Services personnel.

Typically a TP applications program performs several functions in an IAS environment:

- Provides a menu of activities that are possible on the MARK III system or the in-house system
- Does data validation, error checking, or other editing
- Processes most transactions directly, drawing on and updating a data base on the MARK III system
- Processes some transactions through to the customer's in-house host system
- Captures specific data elements for consolidation
- Provides other desired functionality such as store and forward

It is also possible for the in-house host system to initiate transactions to be processed by the MARK III system. In this mode the in-house system treats the MARK III system as a co-processor.

Customer Benefits

Cost Related

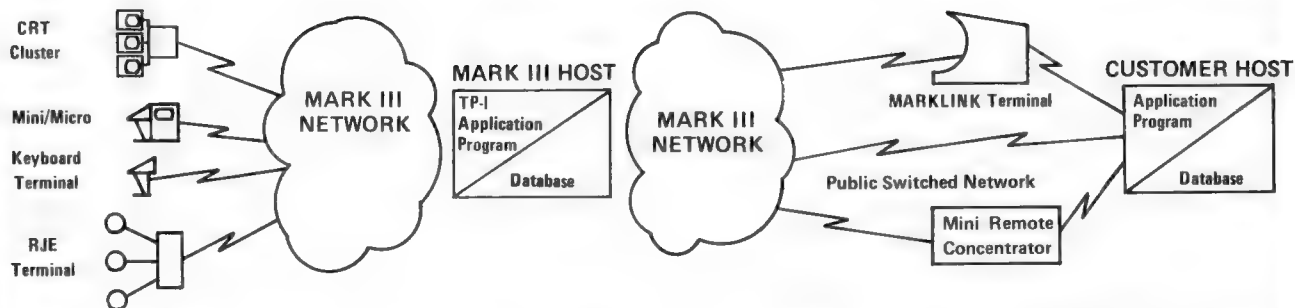
- **Reduced processing cost** — Sharing applications across MARK III Service and an in-house system allows each system to do what it does best, and very cost effectively.
- **Lower development cost** — The cost, complexity and lead time inherent in developing a front end network can be avoided by using the MARK III network.
- **Compatibility** — An IAS system can be custom-designed to interface with virtually any present in-house system, thereby helping to protect the investment in software for this system.
- **Competitive pricing** — Customized systems are accompanied by prices that are designed to take into consideration efficiencies achieved from using standardized components and prior experience in integrating them.
- **Rapid implementation** — All the skilled resources required to implement a worldwide system are available from a single vendor, minimizing the coordination effort for projects of large magnitude.

Feature Oriented

- **Increased functionality** — Numerous features of MARK III Service are not available in-house, including library and author software and proprietary data bases.
- **Support package** — A broad support arrangement is available to provide the resources necessary to support a customer's application including system design, program development, software maintenance, operational supervision, as well as minis, micros and the underlying remote computer service.
- **Added control** — The integration of a variety of remote terminals, micros and minis gives an MIS manager greater control over dispersed operations, including the distribution and use of common software.
- **Consistency of data** — The same data base can be accessed by both the MARK III system and the in-house system, thereby eliminating the need to maintain redundant data or reconcile differences between two systems.

WHAT MAKES UP AN INTEGRATED APPLICATION

Schematic



Many types of terminals, operating at various speeds and protocols, can take advantage of the worldwide accessibility of the MARK III Network to connect to the MARK III host system.

On the MARK III host application programs process input information, access and update databases, and when appropriate, establish a real-time connection to a customer's host system.

This is accomplished through one of three paths. One alternative is to connect directly to a port on the asynchronous communications interface of the customer host system. Another route is via a minicomputer, a MARKLINK® Terminal, which is simultaneously connected to both host systems. A third choice is through a GEISCO-supplied mini remote concentrator installed on-site and cabled to the customer's host system.

Information can be passed through one of the communication links from the MARK III host to a related application program on the customer host system. This process is facilitated by special GEISCO-developed software operating on the customer host system. It, in turn, can perform additional processing, access resident databases, pass information to/from other applications, and use its communication facilities to interact with connected terminals.

Components

- **Remote Devices** — many types of hardware ranging from dumb terminals to minicomputers can be used to enter data and receive output. In addition to the more standard devices depicted, some exciting possibilities are beginning to emerge, including various kinds of intelligent dispensing machines and credit card devices.
- **MARK III Network** — worldwide in scope, spanning 24 countries, 750 cities and 22 time zones. It's based on the most advanced store and forward packet switching technology with dual line logic and diversified routing between major nodes.
- **MARK III System** — provides all computing power an application is ever likely to need. It's based on cluster architecture to obtain a high degree of reliability and capability to handle peak loads. It also features an uninterruptable power supply and back-up protection to help isolate on-line applications from possible disruption.
- **TP-1 Application Program** — software designed to accommodate multiple, concurrent, interdependent users who require access to a common data base. It handles repetitive, high volume, predefined transactions.
- **Dial-Out** — a capability of MARK III Service that allows a user program to place telephone calls through the public switched network, or leased lines.
- **MARKLINK® Terminal** — a GE Information Services Company minicomputer terminal equipped with modems and user software which enable it to maintain a simultaneous connection to both MARK III Service and an in-house system, communicating alternatively with each.
- **Mini Remote Concentrator** — Communications hardware that serves as a network node to provide continuous communications between the MARK III network and an asynchronous interface on the customer's host system. It is located on the customer's site, dedicated to customer's application, and cabled to that system.
- **Customer Host System** — can be virtually any type of standard major computing system. It must have a front end asynchronous communications interface. Depending on the application, customized software may be installed to identify this system to the MARK III system, and to handle communications traffic.

Western Union Telex
* INPUT SARK

* INPUT SARK

* INPUT SARK

* INPUT SARK

INPUT MNTV

2/2/83

TO: DON FOSTLE

FM: PETER

ARE YOU AVAILABLE NEXT TUESDAY, FEBRUARY 8, FROM 1:00-3:00
TO MEET WITH ME AND REPRESENTATIVES FROM GEISCO AT ROCKVILLE, MD.?

*
INPUT SARK



Information
Services
Company

STRATEGY DEVELOPMENT

FROM: Clee McBee

February 24, 1983

RCV 2/28/83

Don Fostle -

Attached is the illustrative example matrix to assist INPUT in understanding the kinds of things we would like covered in the application matrix.

Obviously, we were not exhaustive. Also, certain areas, such as petroleum well siting, although not mentioned specifically, would fall under "Planning" in single-site, analytic, discrete.

We emphasize again that we want to know what growth applications exist outside of our own knowledge base.

We will also be looking forward to your analyses as to what applications will trend into other matrix cells in the future.

Under separate cover, you are receiving background material on our network technology/capabilities and also on our current strategy in the marketplace.

Clee

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IT IS REQUESTED FOR THE... I AM IMMEDIATELY ADVISED BY A SOURCE FOR
INFORMATION... HE DISCLOSED BY AN OPERATIONAL...
...TO BEHOLD AND... OPERATIONAL... SUBJECT... THE...
...IS OPERATING FOR THE... SUBJECT... SUBJECT...

I... WITH THE... IN... TWO... SUBJECT... THE...
...WILL... THE... "STRATEGY"... IS A...
...AT THE... INTERVIEW... AND
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...THE... THE... THE...
...THAT WOULD MAKE IT CREDIBLE. PLEASE CALL SOON AT YOUR CONVENIENCE.
...THE... THE... THE...

THANKS

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ENNA

AI PROFIT ^{SECRET}
CRITIC

HI GRO

BIG COS.

1) Games on TV -

2) Answer Distributors of GEISED INCREASES

GEISED

MCBOS
FRI FEB 18

Single site

LUNCH

Vulnerability of segments

- comment on comatose markets -

Try Meeting on the 4th

Grand Feb 25 - 3 Hours



MARK III® SERVICE OVERVIEW

Today MARK III Service uses the world's largest commercially available international computer services network, serving over 6000 customers worldwide. The service consists of more than 100 separate processing and communications computers that work synergistically as a single system. Remote communications equipment is deployed in key locations around the world, making it possible for users in over 750 cities to connect a computer terminal to the central computer system by simply dialing a local telephone number. With the addition of Telex Service Network ports to the MARK III International Network, customers may also access MARK III Service from places as remote as ships at sea or off-shore mobile platforms equipped with MARISAT terminals.

MARK III Service can link over 90% of the free world's telephones. It is now accessible in 32 countries and 22 time zones on 5 continents. Data is moved over the international network using multiple redundant paths—land lines, undersea cables, and satellites which link all locations to the central computer systems. If one communications path is blocked due to equipment malfunction, the user is automatically and immediately routed to his program and files along other network channels.

The components located in the three Supercenters and throughout the network are so closely coupled in actual operation that they perform as a single, integrated, fully redundant system.

MARK III Service is designed for virtually universal use. This means the system can be useful to business people with limited or no computer experience to the most sophisticated programmers and computer experts.

Features of MARK III Service and associated benefits include:

- **Accessibility**—Through the MARK III International Network and the Telex Service Network and their combined input/output capabilities, MARK III Service is available on a global basis.
- **Security**—Security is a top priority at GE Information Services. The Supercenters are protected with multiple layers of physical and internal security measures, including contingency plans for natural disasters. In addition, extensive security precautions are available for customer data protection. User numbers, passwords, filenames, and file permissions and classifications are among the safeguards provided.
- **Availability**—MARK III Service is available to the user virtually 24 hours a day, 7 days a week, except for scheduled downtime for system-checking and maintenance to upgrade the service.
- **Reliability**—MARK III Service is characterized by its high reliability levels as a result of its built-in redundancy and uninterruptable power supplies.
- **Control**—The system is an effective cost control tool as you pay only for the amount of computer resources used. It is also possible to manage the amount of use, how the service is used, and by whom.

1. GENERAL SERVICES

- **Easy to Use**—Most MARK III Service systems are user-oriented, with simple languages and computer prompts in many instances. Both technical and nontechnical people can use MARK III Service, often with only minimal training.
- **Expandability**—The system is constantly growing in both capacity and technology to meet customers' increasing needs. This means that a user can add a new application or expand an existing one without having to incur heavy capital investment.
- **Customer Support**—Technical documentation is available to assist customers with systems use, languages, or new features. In addition, specialists located in offices worldwide provide local support and training for user personnel in countries serviced by the system.

MARK III Service is typically used in the areas of finance, marketing, manufacturing, engineering, research and development.

GE Information Services has a software library with over 1,800 programs available for customer use. In addition, its Network Software Service (NSS) can be made available to MARK III Service customers. NSS authors are companies in various industries who have developed specialized programs or systems for their business and who offer these programs to MARK III Service customers. Consequently, customers can have the benefit of the knowledge and expertise of their particular industry experts, without having to incur heavy development costs or purchase costly software.

For those customers who lack the manpower and/or expertise to implement large, complex applications, GE Information Services also has systems development consultants who can help with: consultation, system study and software development, and major program conversions.

Users can access the system with a variety of terminal devices including:

- 30 or 120 characters-per-second terminals
- Teletype terminals
- High speed terminals
- CRT terminals
- Plotters

As this description suggests, our international computer services network has the advantages of a centralized system. Since it operates as a single system, it provides a basis of maintaining centralized control over applications and usage. But to each user, it looks like a local, or distributed, data processing system.

MARK III Service can provide remote computing service users with one total solution for the Eighties and beyond.

MARK III SERVICE

History

MARK III Service represents a commitment by General Electric Information Services Company to serve the growing needs of business and industry to manage time-critical information better. As the name of the service suggests, it is the third generation of remote access information systems. The General Electric Company was, to a great degree, responsible for spawning the information services industry during the 1960s.

In 1963, when computers were, if not in their infancy, then certainly in their early childhood, General Electric, in cooperation with Dartmouth College, developed the concept of several users sharing the same computer or computers—the concept of timesharing.

General Electric offered the first commercial timesharing service in 1965. It was called MARK I, corresponding to the first major phase of the information services industry, i.e., timesharing. General Electric Company led in the development of this phase, and today, it remains an international pacesetter in the remote computing industry.

Interactive computer access was overwhelmingly received in the problem-solving environment where it was first put to test. It became apparent that with remote access and sophisticated file-handling capabilities, timesharing could also serve as a business tool to coordinate geographically dispersed activities. Time-critical data could be collected from remote locations, processed, and dispersed from a central corporate point quickly and accurately.

In 1969, General Electric Company introduced large-scale third-generation hardware into the first commercial information processing network, tying together over 40 cities in North America. This added capability, network computing, coupled with timesharing, greatly broadened the potential user base. We ventured from the technical, primarily engineering environment to solving problems for our customers in other business areas on a national and international basis. In November 1969, the service crossed the Atlantic, and London was added to the list of network cities.

By 1972, the network tied into 27 cities in nine European countries, in addition to 300 cities in North America. In October 1972, MARK III Service was born. This service combined both the interactive service with remote batch service. In 1973, MARK III Service crossed the Pacific to Japan and Australia.

In 1976, General Electric Company's Information Services Business Division cut the ribbon for our first overseas computer supercenter near Amsterdam, in the Netherlands. We now have three major Supercenters—in Rockville, Maryland; Cleveland, Ohio; and Amsterdam, Netherlands.

In the fall of 1978, General Electric announced MARK III Distributed Data Processing designed to meet evolving distributed applications processing requirements. MARK III DDP utilizes state-of-the-art intelligent terminal hardware and software, a teleprocessing network, and MARK III processing resources.

1. GENERAL SERVICES

In 1978, General Electric and Honeywell, one of the main distributors of MARK III Service, announced an agreement to combine the worldwide operations of the Information Services Business Division with Honeywell's timesharing marketing operations in the United Kingdom, western Europe, and Australia.

On January 1, 1979, the General Electric Information Services Company, a subsidiary of the General Electric Company, was formed. The new company was 84% owned by General Electric and 16% owned by Honeywell. The company was formed to take advantage of the rapidly growing demand for teleprocessing services and to better serve customer needs for remote access data processing services throughout the world. On January 4, 1982, General Electric Company exercised its option to purchase those shares of GE Information Services stock owned by Honeywell. This buyout makes General Electric Information Services Company a wholly owned subsidiary of General Electric.

In early 1979, the MARK III Service network expanded operations into Venezuela and completed arrangements for a satellite link to Riyadh, Saudi Arabia. On June 1, 1979, GE Information Services announced the availability of MARK 3000 Service based on the IBM 3033 hardware and the MVS operating system including integrated TSO.

On September 1, 1979, GE Information Services acquired MITROL, the developer of the MIMS System, a new generation of computer software offering customized, integrated management information and control systems for manufacturing industries.

In early 1981, GE Information Services acquired LTI Consulting Services Corporation (formerly Lambda Technology, Inc.) a software development firm. This acquisition enabled GE Information Services to provide clients with a greater scope of services.

Other acquisitions made by GE Information Services to broaden its software offerings in the areas noted are as follows: Energy Enterprises (gas and petroleum); Banking Systems, Inc. (banking); Software International (manufacturing); and Network Consultants, Inc. (banking).

In addition, a joint venture between General Electric Company and Structural Dynamics Research Corporation known as General Electric CAE International Inc., resulted in GE Information Services serving as the sales and distribution arm of the joint venture. This joint venture is expected to focus on computer-aided engineering and factory automation software.

Cluster Technology

The MARK III Cluster File System is a unique configuration designed to accommodate a variability in peak capacity, yet to possess the property of a truly continuous service. The system uses a unique approach in multiple machine/multiple file system technology. The Cluster is a composite of multiple machines and multiple file systems with machines autonomously, and yet in concert, addressing physical and logical file systems. The volatile information needed to respond to failures and to avoid conflicts with separate users as they simultaneously attempt to read, alter, and change information is carried passively with the data itself.

A new hardware device was developed and manufactured for support of the Cluster. This special device, known as the SPAD (Scratch Pad), was equivalent to having a disc pack

1. GENERAL SERVICES

subsystem of zero seek time, latency time of several micro-seconds, and transfer rates at near megabyte levels. This provided a thousand-fold increase in performance and made it possible to deliver conflict information to multiple machines.

Initial MARK III Cluster Systems are composed of multiple central processors with concurrent access to multiple file systems. With this technological breakthrough, MARK III Service is designed to dynamically load-balance its central processors in the cluster where maximum resources are available. This even distribution of load across multiple processors provides more effective resource utilization. The result is more consistent response throughout the day, permitting much improved user productivity.

Virtually 24-hour-per-day availability can be achieved through the Cluster System. During maintenance or downtime on a central processor, the remaining systems in the cluster are designed to pick up the load.

By eliminating customer dependence on a single processor, downtime due to processor failure is greatly reduced. Customers no longer experience service shutdowns when a single processor fails. Only a momentary service interruption should occur as the load is shifted to another processor in the cluster.

This application of advanced technology results in definite economic benefits for both the customer and GE Information Services.

In summary, the Cluster File System was a significant milestone in the evolution of MARK III Service. Most importantly, it was the beginning of yet another evolution which should produce within the next few years a computer unequalled in capability and unmatched in performance and yet preserving the vitality and flexibility to track an industry that has phenomenal technological growth within itself.

Security

Sharing a computer network with thousands of other users naturally brings up questions of security. Potential users may have doubts about the safety of files against deliberate or accidental destruction, modification, or disclosure to unauthorized personnel.

A broad and highly sensitive customer base makes it imperative that GE consider security to be top priority. There are a large number of security measures of MARK III Service which are designed to provide data security—most user-controlled, others an integral part of the service. Some of the features of MARK III Service security are outlined below.

Each customer's catalog is logically constructed as a "separate entity" in GE Information Services' system.

The system is designed so that no one may access it without a currently valid user number. Once in the system, the user number restricts the user to programs in his catalog.

Passwords are designated as an integral part of the user number. Thus, without the appropriate password, an unauthorized user will not be allowed to access the system even though he enters a valid user number from a terminal permitted to accept it. A data encryption algorithm is available for the encryption of binary files based on user-supplied

1. GENERAL SERVICES

keywords. Whenever a password is requested by the system, either for a user number or for a file, a mask of dense characters is printed at the terminal before the user is requested to enter the password. Furthermore, passwords may include non-printing characters which can be used to further disguise passwords being entered.

More than one password may be assigned to an individual user number. The Administrative User of the catalog may add, change, or delete passwords on user numbers in the catalog as required. By using the Immediate Run (IR) capability, the protection of a user number may include multiple levels of passwords, time-of-day restrictions, file access restrictions, and program capability restrictions.

Within a large catalog it may be desirable to regulate the amount and type of usage by other people in your organization. Special Administrative User features permit the data processing coordinator or subscription manager to control usage and amount of volume.

Within the catalog itself, each user can protect his individual programs and data files to the desired level of security.

Files may be accessed by name only. Thus, knowledge of the file name can be withheld from anyone not authorized to use a particular file. Files may also be passworded for additional protection. Users are also protected from accidentally attempting to save two files with the same file name, thereby erasing the first file by mistake.

Individual user files may be protected by a number of means. Among these are:

- Storing data in binary format so that it cannot be listed;
- Encrypting the data in a file with an encryption routine;
- Passwording the files;
- Permitting the file for specific use, such as "read only";
- Making all access to a file through the use of an Immediate Run program.

The MARK III Service Supercenters are located in buildings which have been extensively equipped for protection against all types of disaster. Considerable fire prevention and equipment protection measures have been taken. Electric power is protected by the use of dual feeders from the power company, as well as an Uninterruptible Power Supply (UPS) System.

MARK-NET
PRODUCT MATRIX

Protocols	Host PADs	Host Gateways	Network Gateways
Asynchronous	⊖	✓	✓
Synchronous: Bisynchronous 3270	✓		✓
Bisynchronous 3780/2780	✓		✓
X.25/SNA		✓	✓

○ = Now

MARK-NET
ASYNCHRONOUS SERVICE
Terminal Support

- Telex
- Asynchronous TTYs
 - 100 devices
 - 36 different vendors
- MARKLINK Terminal TSI
- Personal Computers
 - IBM PC
 - Apple II Plus
 - TRS-80

MARK-NET
ASYNCHRONOUS SERVICE
Host Support

- Asynchronous Modem Interfaces
 - Host Qualified
 - IBM 370-Compatible
 - Honeywell DPS-8
 - To be qualified:
 - DEC
 - TANDEM
 - Others by demand

Matrix depicts network/communications protocols we ~~currently support~~ expect to be part of value added network offering over next 1-3 years. Roll out depends on market demand & economics. These communications options would also serve our processing capabilities and extend processing interface beyond ~~currently interface~~ options (i.e. asynch, 3780/2780 and 3270 simulation)

RCVA 3/1/83 12:25 pm

OBJECTIVE

FIRST BULLET--

SEGMENT THE MARKET FOR GEISCO'S BUSINESS IN 1983. REVEAL TRENDS AS APPROPRIATE TO GEISCO'S PARTICULAR INTERESTS IN THESE MARKET SEGMENTS.

SCOPE AND METHOD

THIRD BULLET--FIRST PARAGRAPH

THE PROJECT STARTED WITH A MEETING AT GEISCO. THIS MEETING DEVELOPED THE PRELIMINARY SEGMENTATION OF GEISCO'S BUSINESS BASED ON THE WORK ALREADY PERFORMED. THIS SEGMENTATION WILL BE AT TWO LEVELS.

THIRD BULLET--SECOND SUB

MICRO LEVEL WHERE EACH OF THE CELLS IN THE MACRO MATRIX WILL BE BROKEN DOWN INTO COMPONENT PARTS. THE COMPONENT CELLS WILL COVER TYPE OF APPLICATION: PROCESS, ANALYTIC, SINGLE-SITE, MULTI-SITE, DISCRETE, AND INTEGRATIVE. THE ADVANTAGES/DISADVANTAGES OF PARTICULAR TYPES OF SERVICE I.E., PROCESSING SERVICES, PROFESSIONAL SERVICES, ETC., WILL BE DISCUSSED FOR EACH APPLICATION.

FOURTH BULLET--

IN THIS MEETING, INPUT AND GEISCO STAFF DISCUSSED THE CELLS IN TERMS OF GEISCO'S STRENGTHS, BUSINESS STRATEGY, AND ANY THOUGHTS ON THE MARKETS IN THOSE SEGMENTS.

FIFTH BULLET--

THIS MEETING WAS HELD ON FEBRUARY 18, 1983.

SIXTH BULLET--

FOLLOWING THIS MEETING, GEISCO WILL SEND ILLUSTRATIVE EXAMPLES OF THE TYPES OF APPLICATIONS OF INTEREST IN EACH CELL. INPUT WILL PRIORITIZE EFFORTS BY GROUPING INFORMATION INTO "EXTENDED FAMILIES" AROUND THESE EXAMPLES.

WHILE AWAITING THESE EXAMPLES, THE INPUT ANALYST WILL ADDRESS SEVERAL OF THE KEY SUBJECT AREAS IN PART III, PAGE 3 OF OUR 2/17/83 MEMO. INPUT WILL GIVE THEIR OPINION AND CASE STUDIES, AS APPROPRIATE, ON THE POINTS AGREED TO IN OUR FEBRUARY 18 MEETING.

UPON RECEIVING THE EXAMPLES FOR THE MATRIX (TO BE SENT FEBRUARY 24 BY GEISCO), INPUT ANALYSTS WILL:

11TH BULLET--

FOLLOWING THE SEGMENTATION, INPUT WILL DEVELOP FORECASTS FOR SEGMENT PERFORMANCE THROUGH 1987.

- THIS WILL INCLUDE PREDICTIONS OF THE LOST BUSINESS IN EACH SEGMENT.
- THE ROLE OF DATABASES/INFORMATION NEEDS IN EACH SEGMENT WILL BE DISCUSSED.
- GROWTH IN EXISTING SEGMENTS WILL BE ANALYZED.
- GROWTH IN NEW OR EMERGING SEGMENTS WILL ALSO BE FORECAST.
- END-USER TRENDS WILL BE DISCUSSED.

12TH BULLET--

AS WELL AS THE MARKET FORECAST, ANALYSIS OF THE COMPETITIVE DYNAMICS IN EACH SEGMENT WILL BE MADE. SUMMARIES OF BACKGROUND/ANALYSES USED TO ARRIVE AT SEGMENTATION AND COMPETITOR TREND INFORMATION WILL BE PROVIDED XXX PROVIDED.

INPUT SARK

RCVA 3/1/83 12:25 pm

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INPUT SARK



General Electric Information Services Company

401 N. Washington Street, Rockville, Maryland 20850 (301) 340-4000

February 17, 1983

Mr. Peter Cunningham
Mr. Donald Fostle
INPUT

SUBJECT: RESULTS OF MEETING AND SUMMARY OF STUDY OUTLINE FOR GEISCO

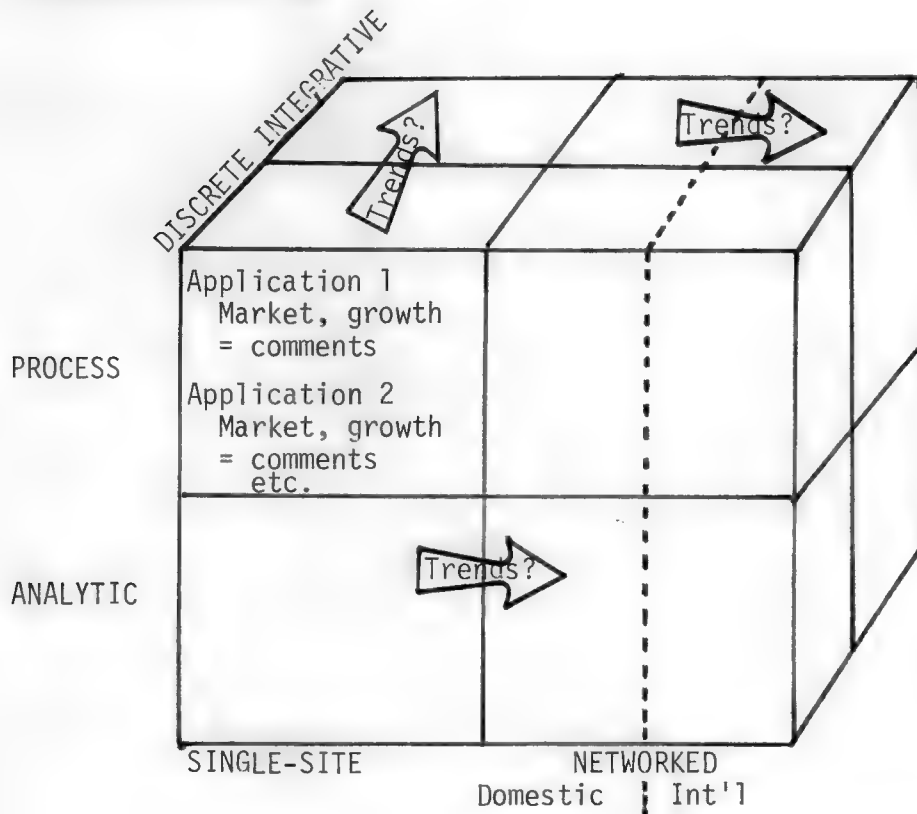
Gentlemen:

According to our meeting discussion last Tuesday, the following items/points should be covered in the INPUT study report due in mid-April:

I. GENERAL EXPECTATIONS --

- Refine the "gameboard" matrix which we laid out at that session.
- For each playing square, provide broad segmentation by application *areas* specifically giving market sizes and growth rates (next five years); competitor dynamics; and examples of specific applications *of* interest to GEISCO. *new*
- Although the matrix will necessarily be quite abbreviated, background discussion and/or analyses utilized by INPUT to arrive at segmentation options should be provided separately and appropriately keyed to the matrix items.
- For each segmentation option define the total actual expenditures by users on each application, including in-house expenditures. Where feasible, discuss the currently realizable vendor market for each application from this total expenditure "pie" and suggest factors which might sway a user to switch from in-house to vendor purchase, and vice versa, in the future.
- GEISCO is specifically interested in those applications which would naturally find strength in our worldwide network, i.e., multi-location company applications; linking of discrete, functional needs within a company; and/or applications requiring interactions between separate companies/industries.
- Although network applications are important, INPUT should not in any way limit their thinking to include only those applications with network content...if it's a winner in information services, we want to know!

II. GAMEBOARD/MATRIX --



Definitions:

Process - has an immediate, continuing business need, i.e., on-line production or production reporting; could be continuous connect.

Analytic - problem-solving; non-repetitive; one time reports, etc.

Single-site - usually self-explanatory except that if a local net cannot handle intraorganizational needs, the application should be moved to "networked" as a special category

Networked - include international network applications as a discrete subset.

Discrete - information needs involve only one application category, e.g., shipping, order processing, engineering design.

Intergrative - one or more applications are linked together, e.g., sales forecasting-design engineering-^{N. Carrick} materials resource planning. It will be important in this category to define those application families now existing, and linkages likely to occur in the next several years.



III. KEY SUBJECT AREAS TO COVER --

--Either in the matrix or in accompanying written material --

- Integrated application trends
- The split between intraorganizational and interorganizational application needs
- Applications which apply to only one function and those which are cross-functional. Applications which apply only to a single industry and those which are cross-industry
- ✓ ● The role of databases/information handling in each application; what are the trends? ✓
- ● Legislative/regulatory environment which may create information service application demands; e.g., SEC, EPA, OSHA, etc. requirements. Include here the additional "requirements" which a business may place on itself in reporting to its stockholders.
- ● Application opportunities in the GNP sectors, i.e., agriculture, trade, manufacturing, services, government, entertainment, etc.
- ✱ ● Application opportunities which build on particular delivery vehicles, either singularly or as the core. By delivery vehicle, we mean professional services, packaged software, processing, etc.
- ✓ ● Trends in single-site versus multi-site applications
- ✓ ● Trends toward international application needs; specialized, new trends in domestic application needs
- ● Application needs specific to the following end-user groups:
 - Corporations -- by size category. Preferably the FORTUNE 1300, medium-size businesses, small businesses. INPUT should use their own definitions of "medium" and "small" for each industry classification, but should advise GEISCO of the specifics.
 - Consumers/the Public
 - Professionals -- doctors, real estate agents, lawyers, etc.

*What applications
lead themselves to
- RCS
- Prof Svcs*



IV. DISCUSSION OF GLOBAL TRENDS/ISSUES --

To set the study in perspective, and to aid GEISCO in its thinking about the factors which might impact on the information services industry, the following topics should be discussed in the study report:

- Trends in the replacement or co-existence of pure in-house systems with the computer "utility." Topics of interest might include total information service facility management, application management, and intelligent networking.
- Integration and linkage of microcomputers. What about linkage of microcomputers to communications, entertainment, and processing network?
- The demographic trends which might drive different application needs i.e., aging population in the U.S.
- Trends in international interdependencies, i.e., the expanding role of LDC's and how this might create new information/application demands.
- The impact of societal computer-familiarity on the information industry...opportunities, problems, boundaries. As an example, will every person now under the age of six know how to program when they graduate from high school/college? Will there really be a shortage of programmers in 10-12 years?
- What are the likely economic trends; will the next cyclic downturn be handled differently, and if so, how might that impact the information services industry?
- What are the sustainable price levels in information services if hardware prices continue to drop as rapidly as they have?

Sincerely,



Carol Lee McBee, Manager
Strategy Development

/bjn

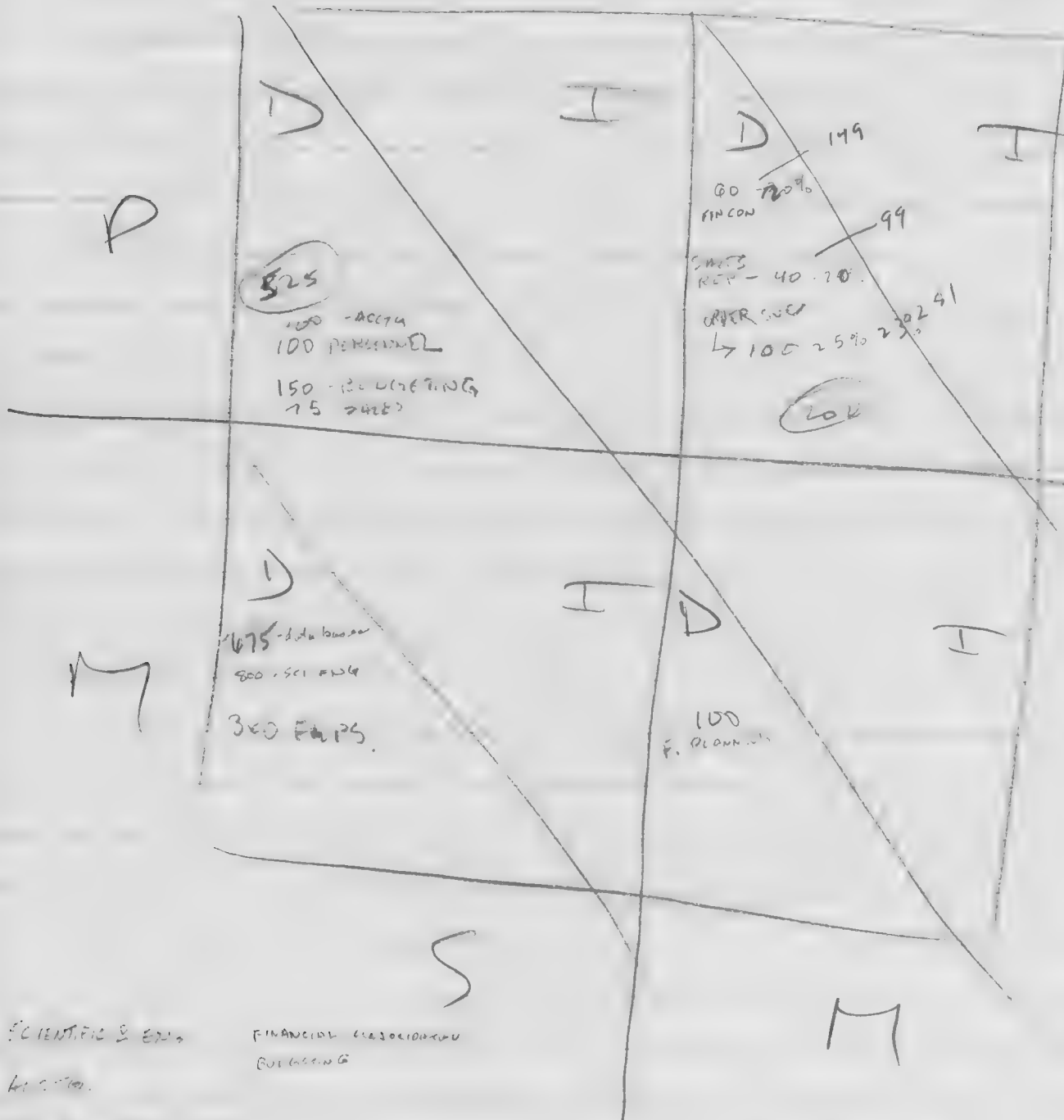
cc: P. B. Berns
P. J. Castaldo
D. F. Foster
W. J. McNerney

41

Processing Services

\$2.6B

CROSS INDUSTRY
(FUNCTION SPECIFIC)



SCIENTIFIC & ENG.

FINANCIAL & SOCIETY
BUSINESS

ACCTG.

SWTS - XED

DES. INCL. PERSONNEL

STW

79 - SCI. ENG

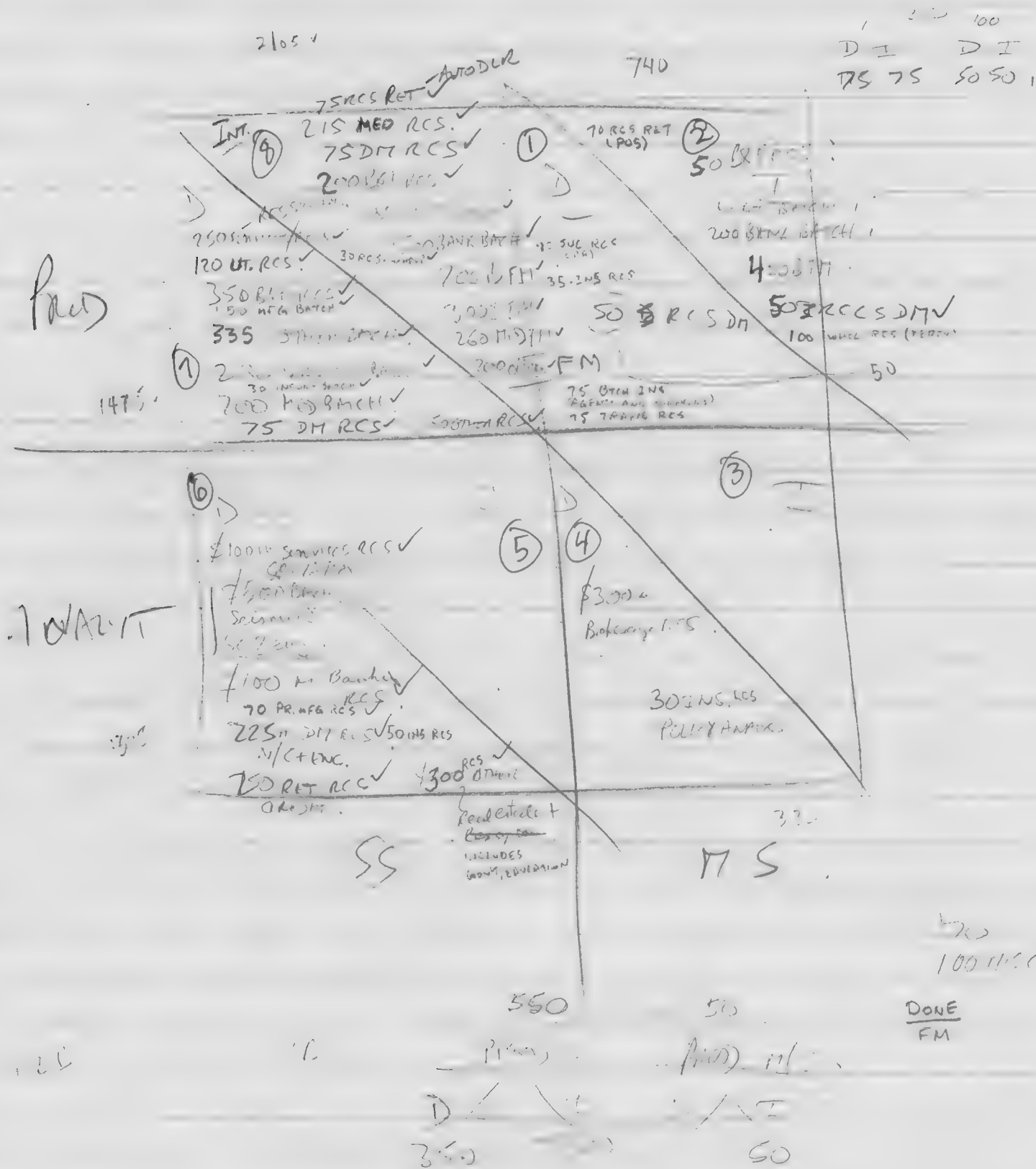
8 - PLANNING

40 - PERSONNEL

11

\$7.00

INDUSTRY SPECIFIC

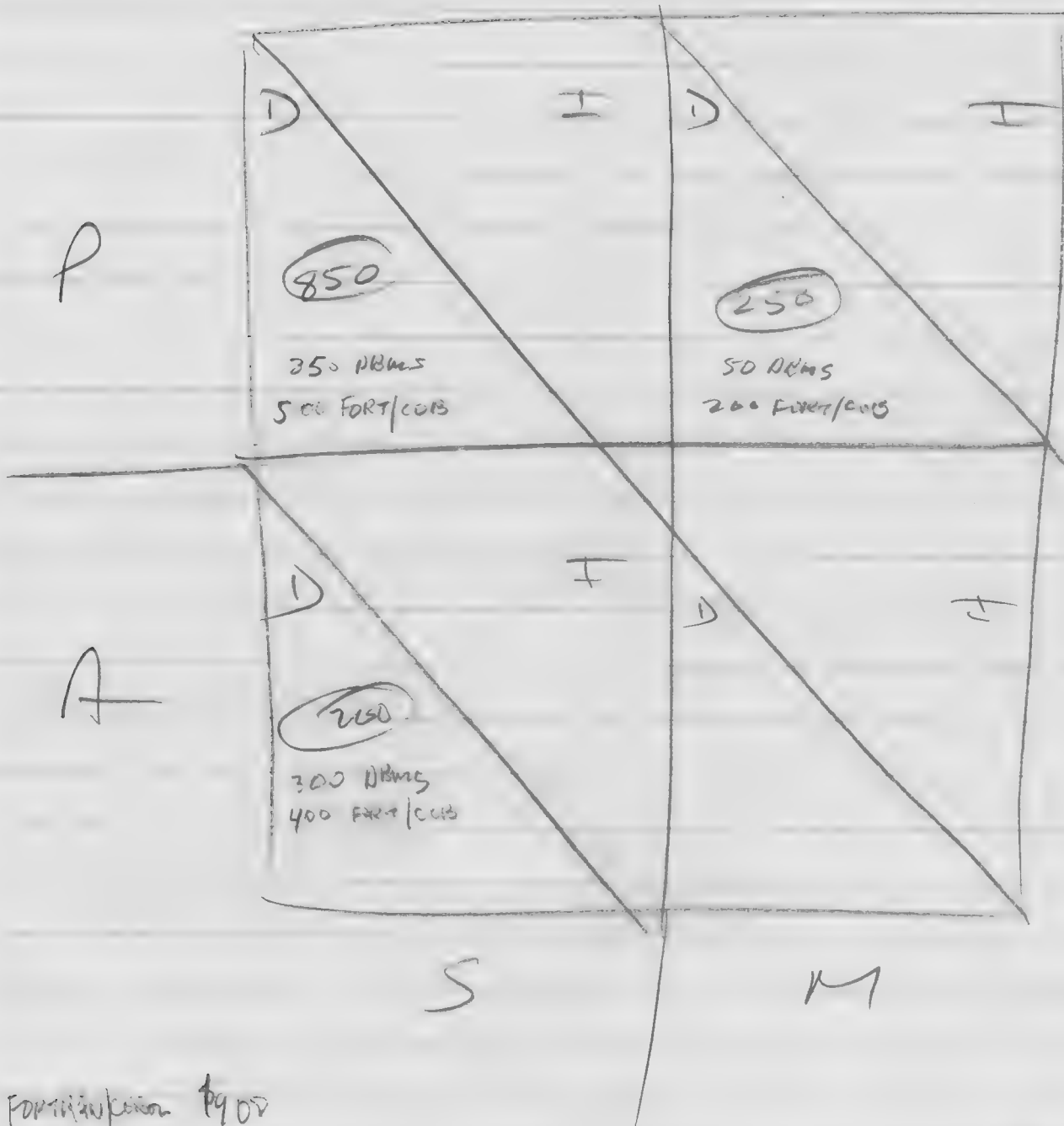




PROCESSING SERVICES

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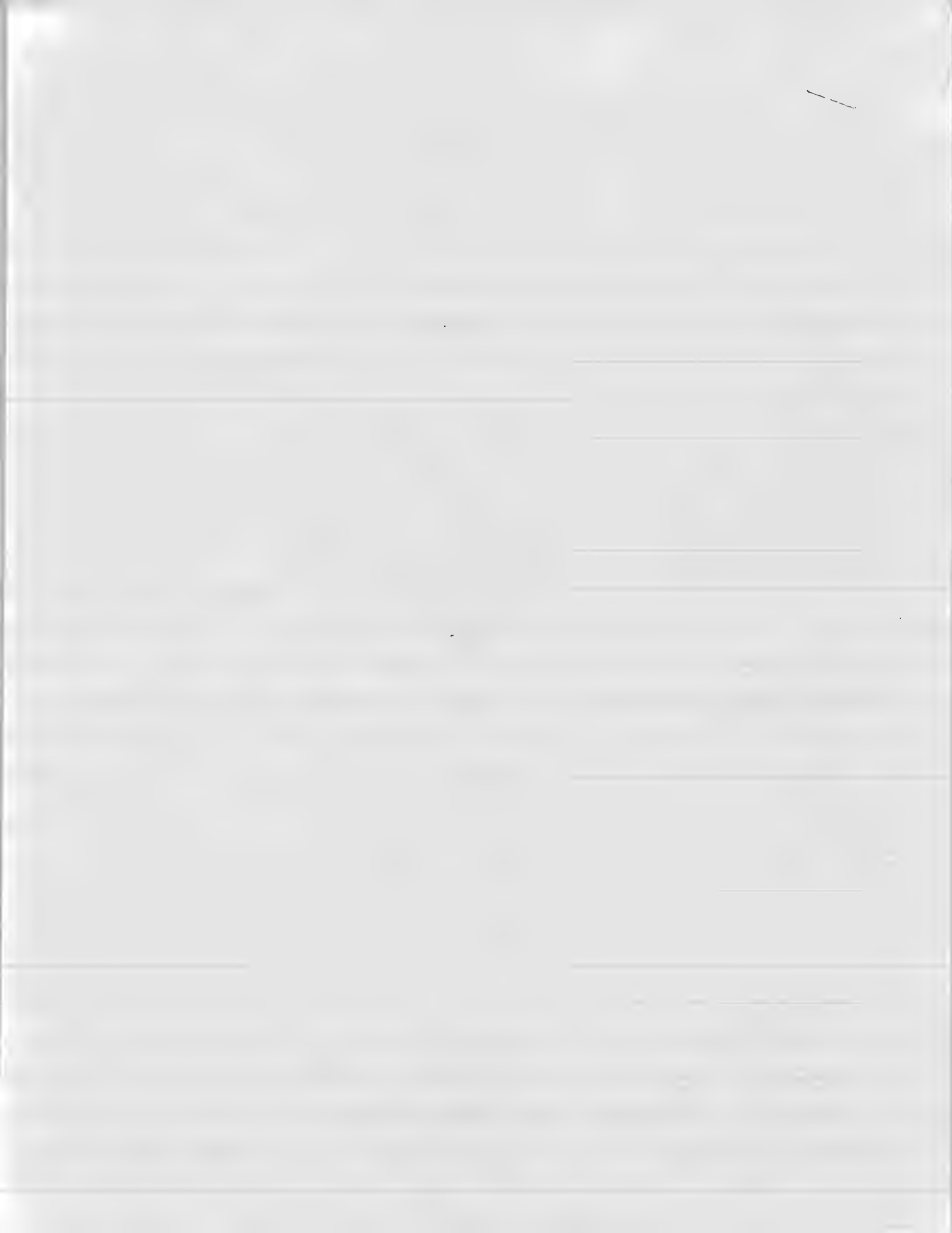
UTILITY



FORNATION 1900

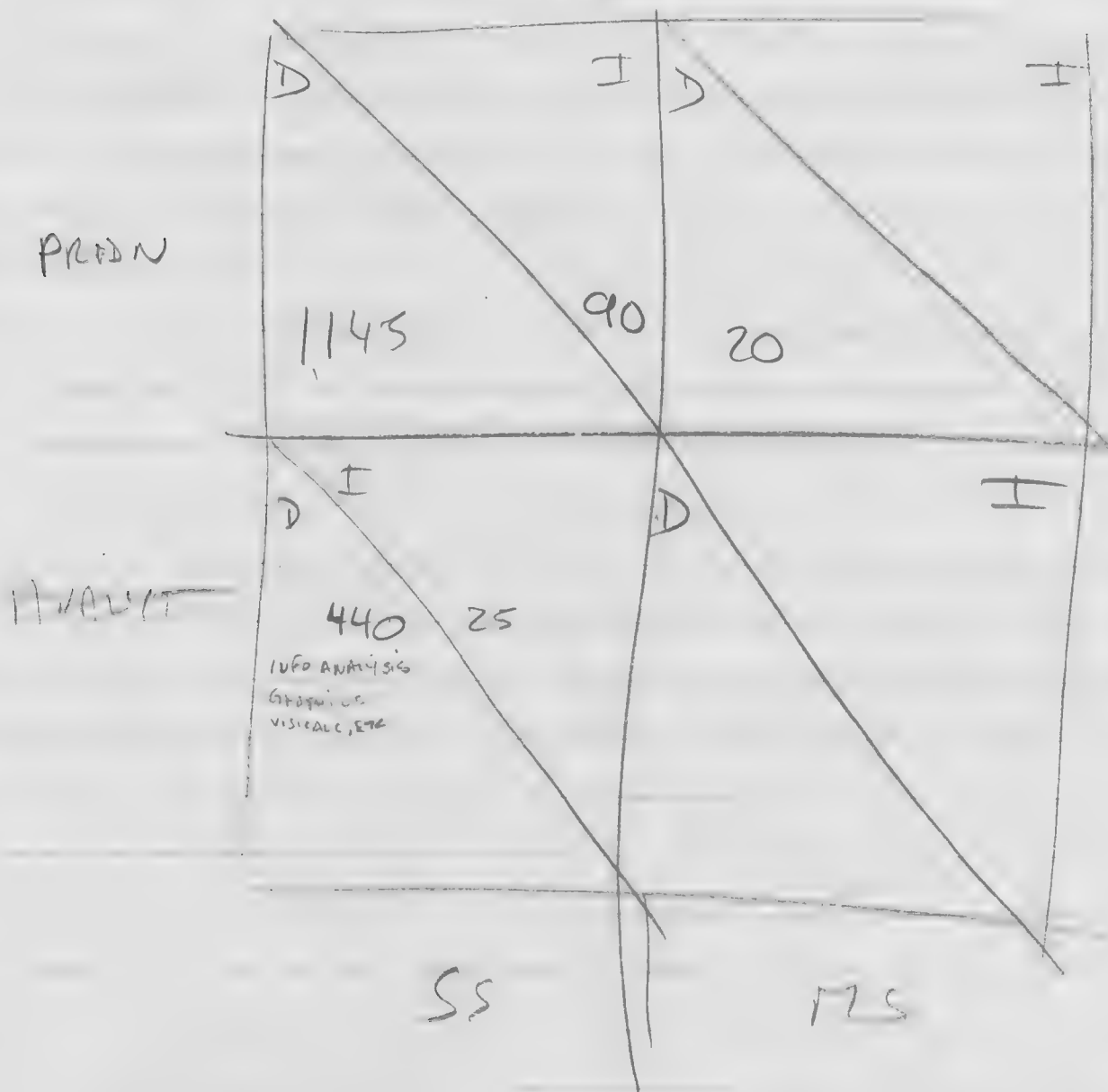
refined 100 NBRMS 'white' 1000 NBRMS

50k



APPLICATION SOFTWARE PRODUCTS

CROSS INDY





P 5107
P 526
MAS UT

APPNS SORT

1.2 INDY SPEC 82

1.7 B CROSS INDY.

2.9

ANALYT		PRDN		D.I	
Inte ANALYS					
.35	.35 IA/SS	.66	ACG/SS	.16	
.08	.08 GRAPH/SS	.29	HR/SS	.20	.09
.01	.015 .025 OTH/SS	.18	WP/SS	.14	
.101	.01 <u>SMO</u> /SS	.025	OTH/SS	.025	
.44	.025	.06	SMH/SS	.06	
		.02	SMH/MS	.02	
		<u>902</u>			

SALES WITH Distribution
Check Annual Rep.

107 = 17,250

INTEGRATED SYSTEMS OPPORTUNITIES

- **Provide More Interfaces**
- **New Customer Support Methods**
- **Increased Continuing Revenue**
 - **Maintenance**
 - **Support**

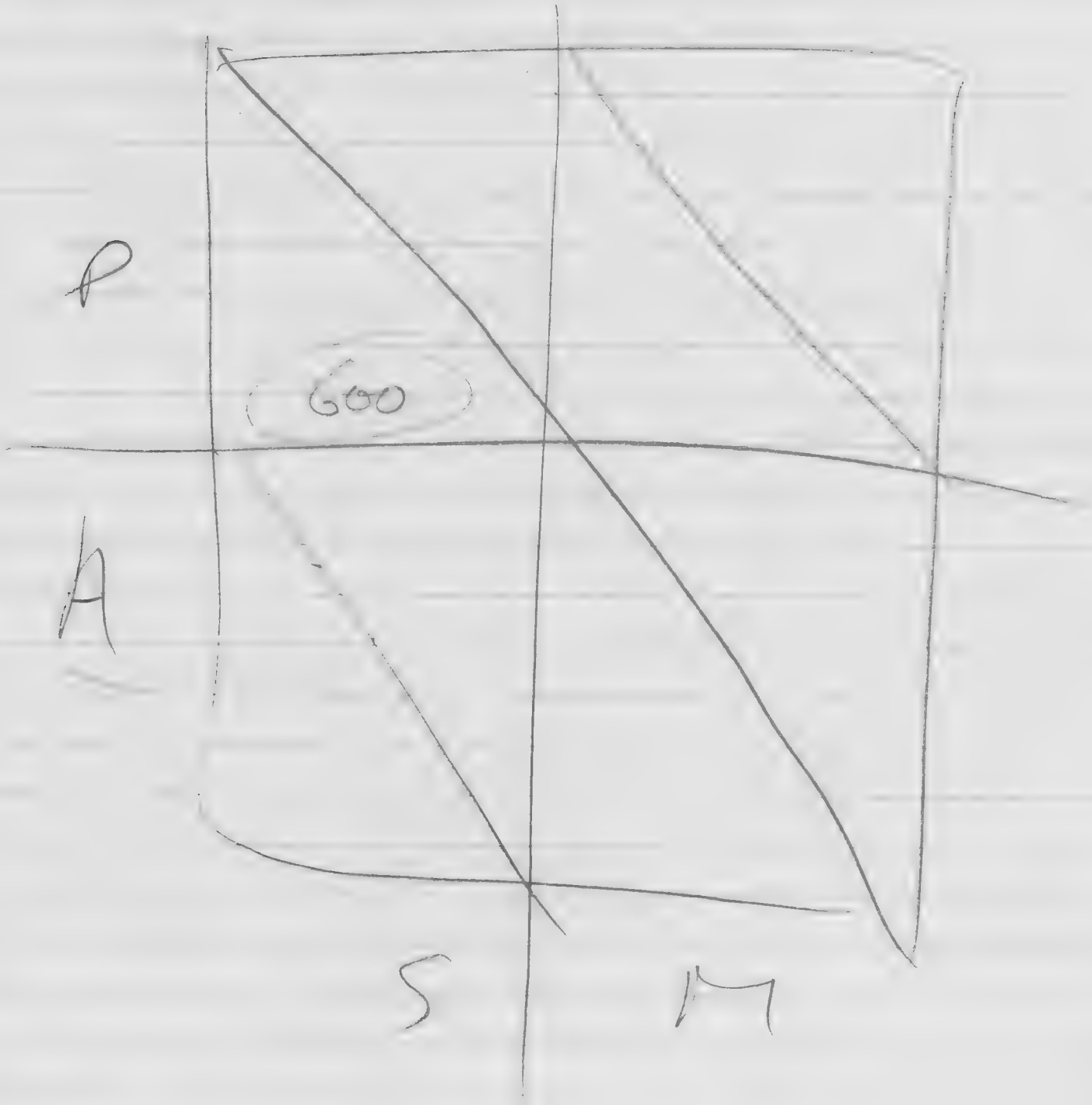
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INPUT

PROF SVCS

CONSULTING ✓

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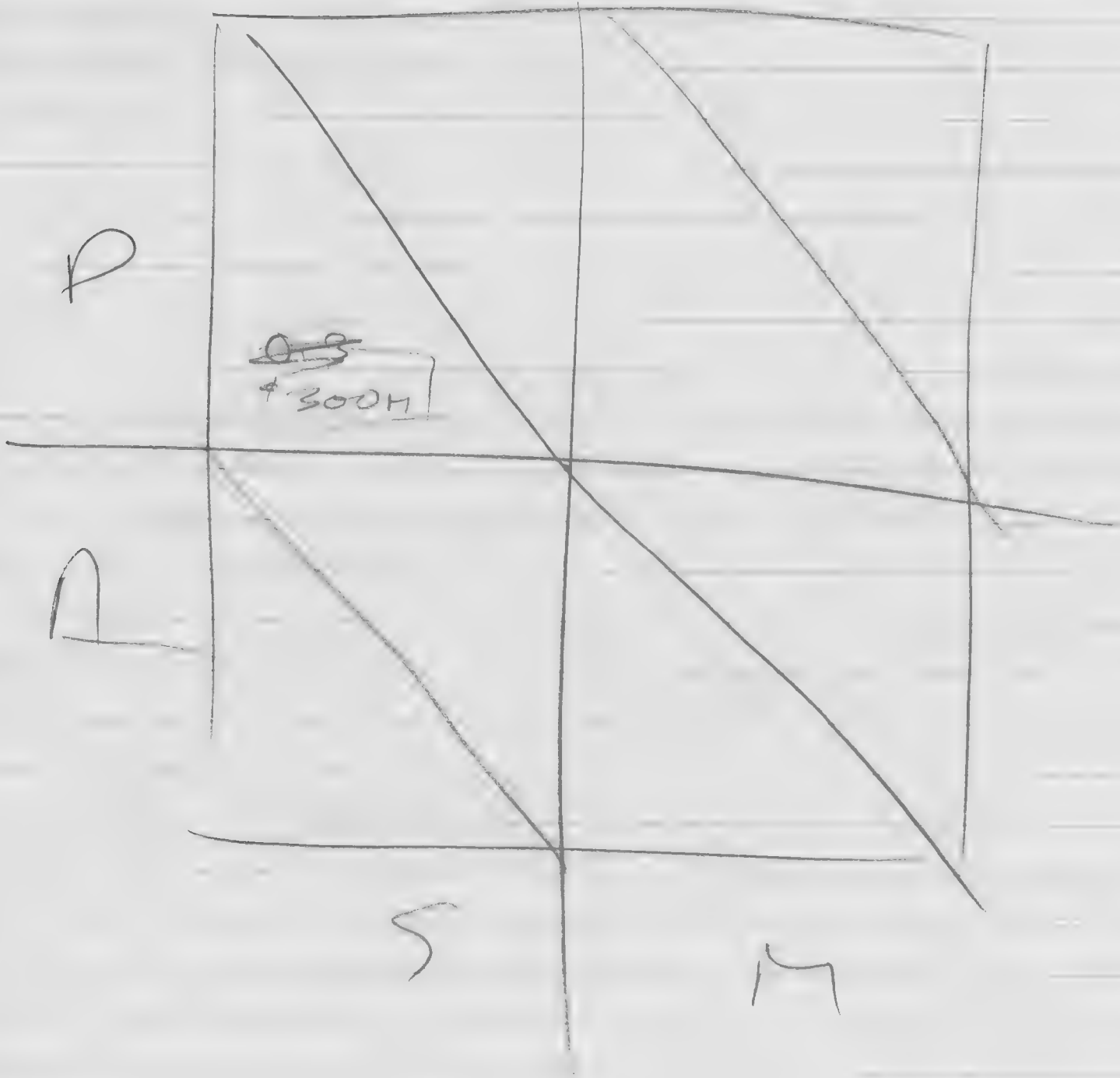




PROF. SVCS

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ED & TRAIN ✓

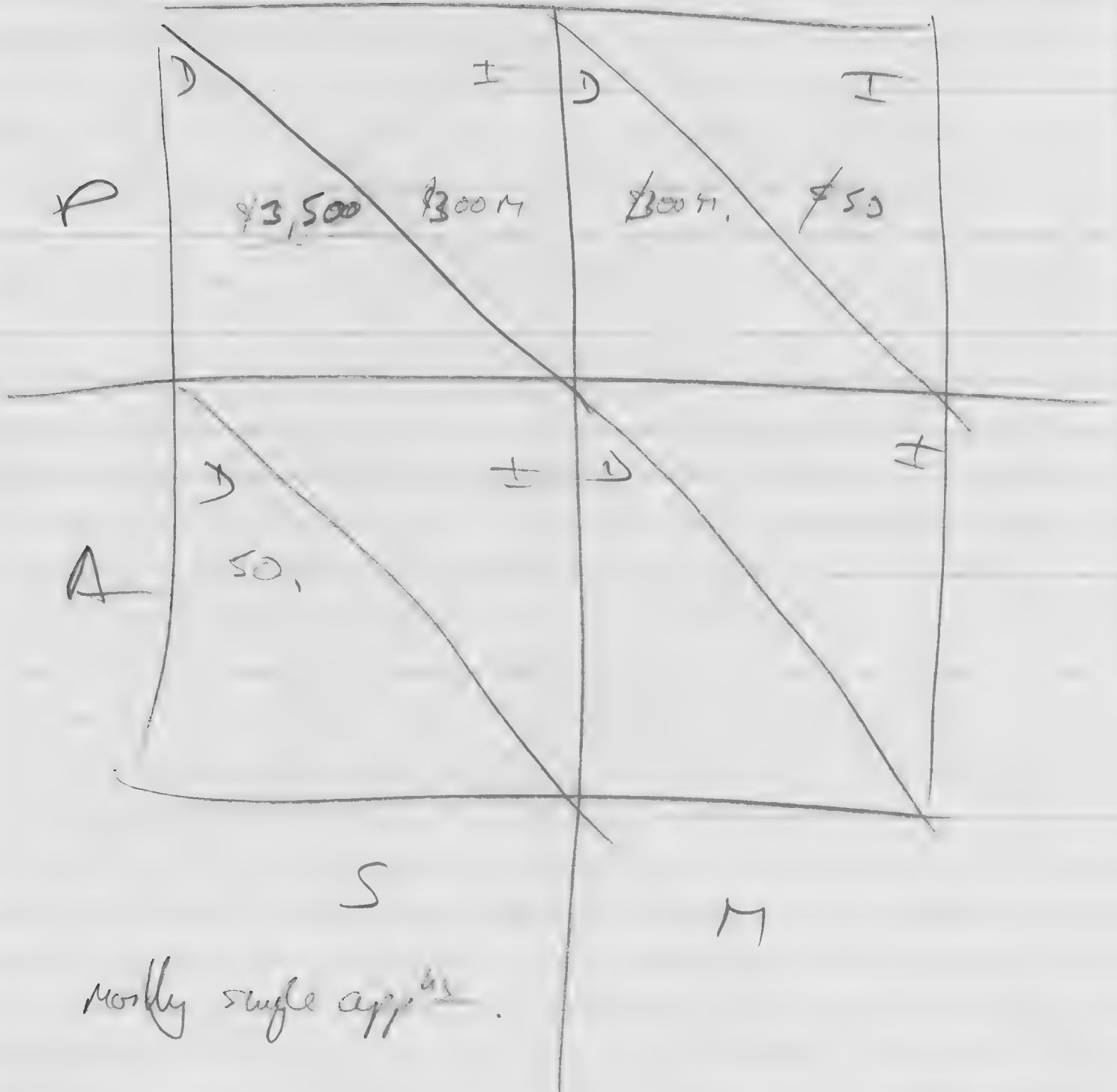




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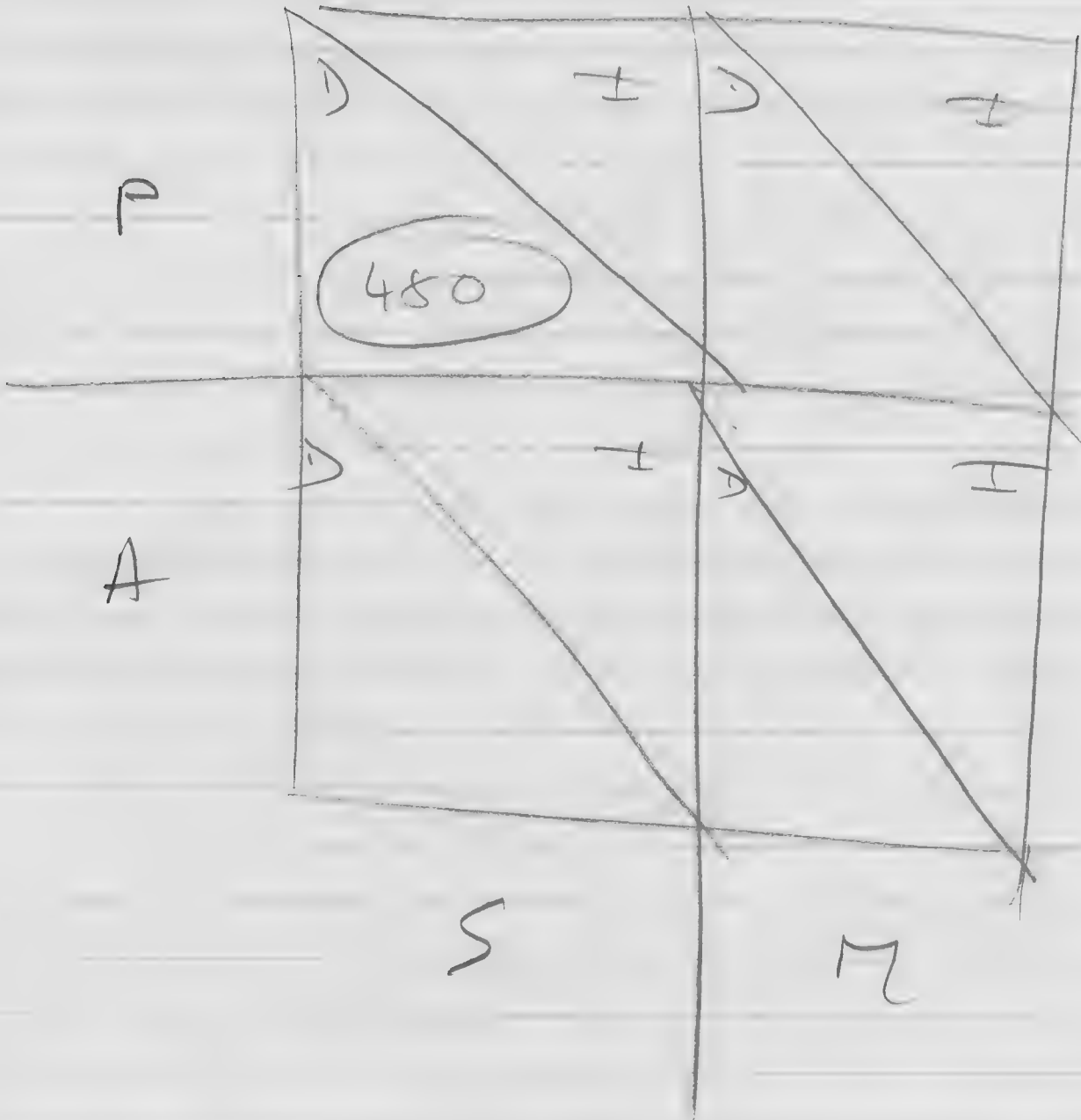
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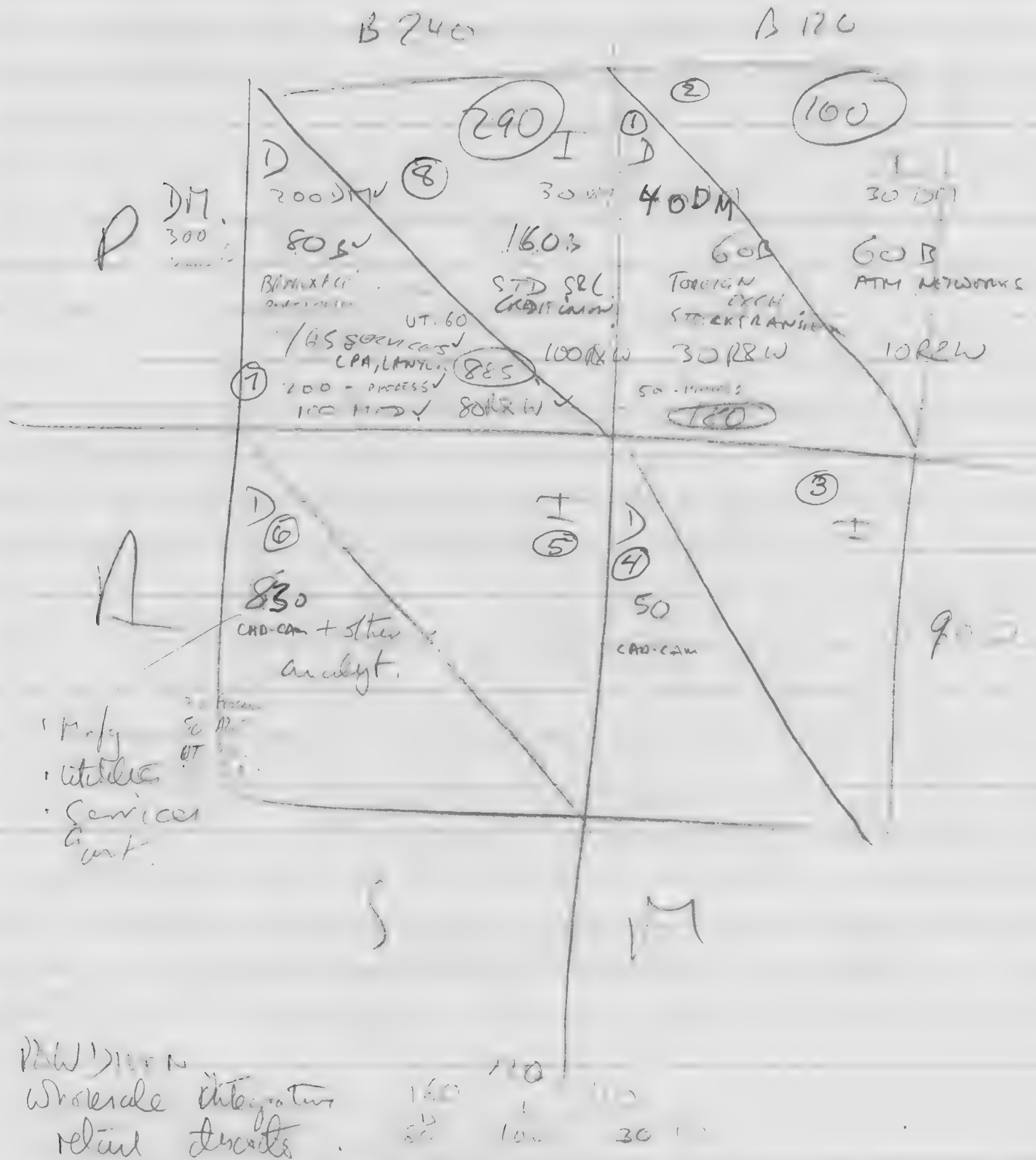
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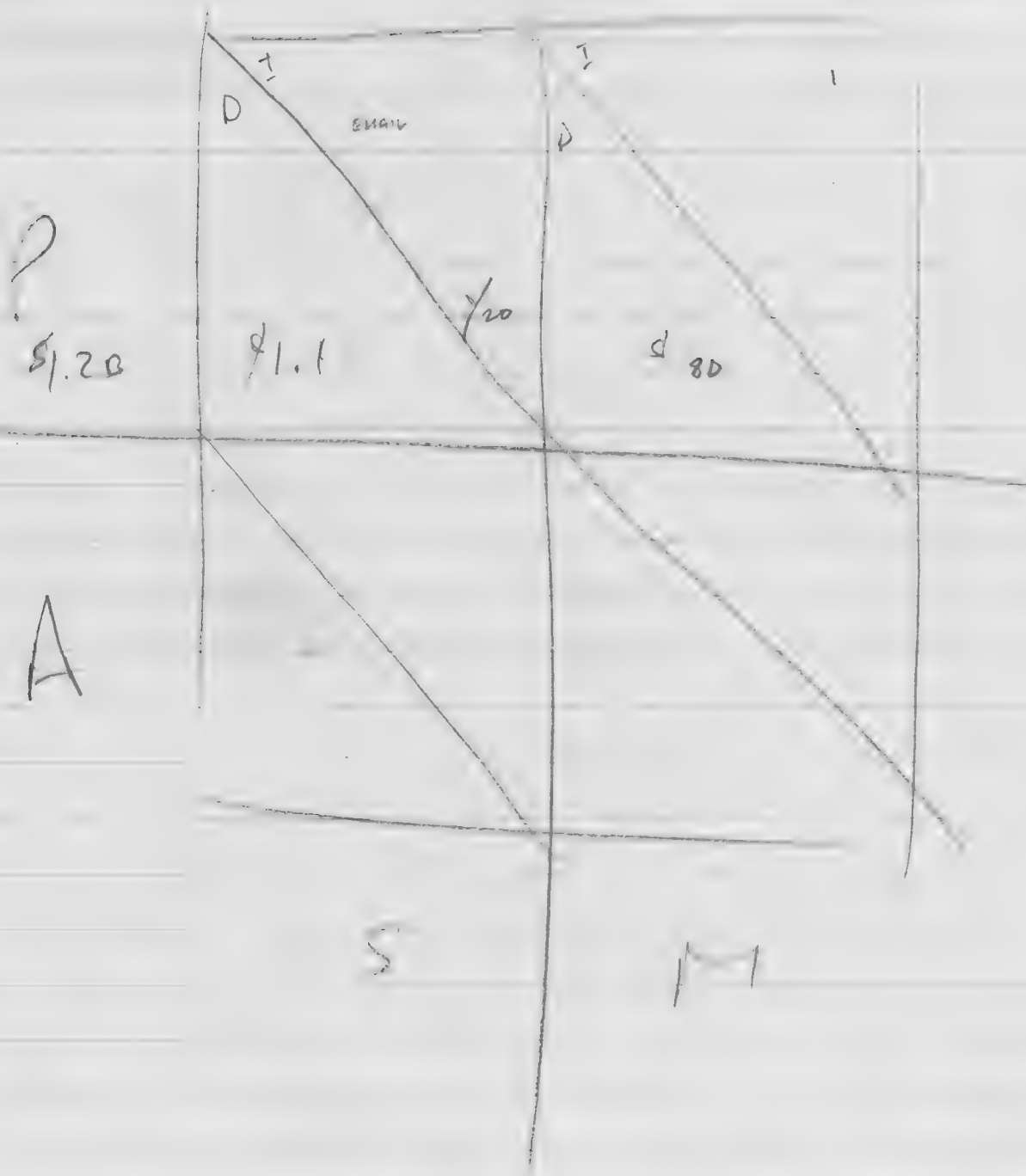




INTEGRATED SYSTEMS ✓

\$1.2B

CROSS INDUSTRY S



11

PROJECT WORK STATEMENT

TITLE VAN COMPETITIVE ANALYSIS

CLIENT GEISCO

CONTRACT: ATTACHED _____ TO FOLLOW _____ LETTER _____ VERBAL _____

PROJECT LEADER Don Fostle PROJECT CODE YVEG

DATE STARTED 4/15/84 PLANNED COMPLETION DATE 6/30/84

LEVEL OF EFFORT(Professional Man Days) 30

DISTRIBUTION

CONTRACT FILE

LIBRARY FILE

NEW JERSEY

INPUT LTD.

D. Fostle
Originator

TOTAL CONTRACT VALUE: \$ or £ \$34,900.00

REVENUE DISTRIBUTION (% or \$) INPUT US 100% INPUT LTD _____

REIMBURSABLE EXPENSES: NO _____

YES X

EXP. BUDGET _____

TO COVER: TRAV: X
TELE: _____
RPT. PREP.: _____
OTHER: _____

BILLING SCHEDULE DESCRIPTION 50/50 split

SHEILA (Y&Z only)

BINDER COPY

5/15/84
Date Typed'

PROJECT DESCRIPTION Analyze positions and strategies of primary
and secondary VAN vendors.

INDICATE TYPE OF WORK: REPORT _____ PRESENTATION X

THANK YOU PACKAGE: YES _____ NO X

ACCOUNTING USE ONLY: ENTERED ON CURRENT PROJECT LIST ✓

INPUT

11

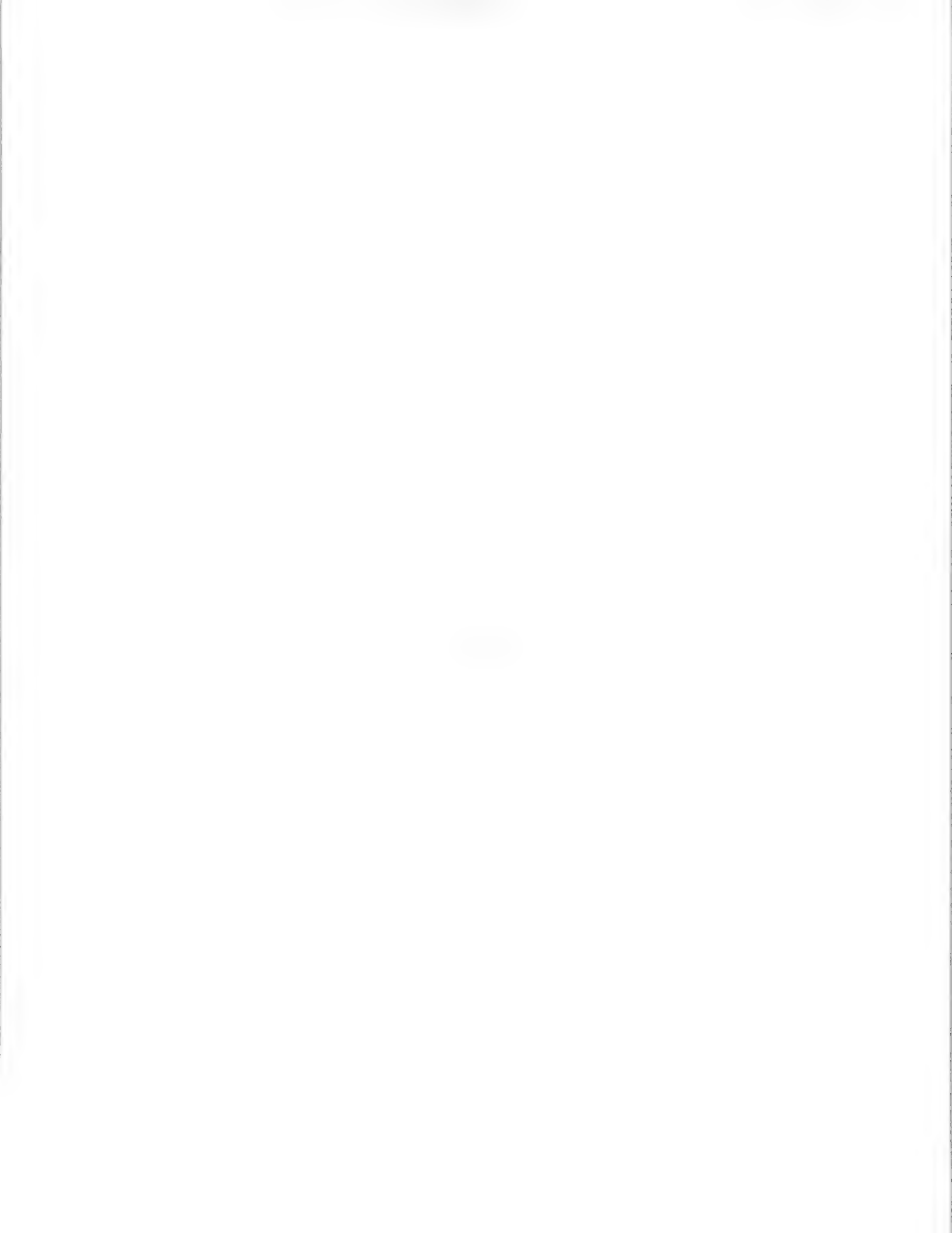
TYMNET

- HISTORICALLY VERY POSITIVE CASE LOOKS LESS ATTRACTIVE IN PERSPECTIVE.
- REVENUE GROWTH SLOWED TO ONLY 15% NAFF IN 1983.
- MARGINS IN CONTINUOUS DECLINE TO ONLY 8% IN 1983. WHEN ADJUSTED FOR OPERATING BASIS THEY REACH 3.2% PRE-TAX.
- NETWORK INVESTMENT HAS INCREASED FASTER THAN REVENUES, 52% AVERAGE GROWTH IN INVESTMENT, 40% AVERAGE GROWTH IN REVENUE.
- TYMNET ONCE LOOKED FINANCIALLY LIKE A COMPUTER SERVICE BUSINESS; IT NOW LOOKS LIKE A COMMUNICATIONS BUSINESS. VERY CAPITAL INTENSIVE.
- NUMEROUS PRODUCT ANNOUNCEMENTS AT TYMSHARE AND TYMNET HAVE ALL BEEN TELECOMM ORIENTED. SEE MAIN STUDY FOR CHRONOLOGY, P. 72 ff.
- TYMSHARE REORGANIZATION AFTER ACQUISITION LEAVES PICTURE UNCLEAR AS TO FUTURE COURSE.

IBM I/N

- A FACILITIES MANAGEMENT APPROACH TO TURNKEY NETWORKS.
- RATES HIGH, NOTABLE ABSENCE OF VOLUME DISCOUNT.
- SNA AVAILABLE BUT NOT GROWING FASTER THAN BISYNC. CLAIMED ADVANTAGE IS END-TO-END DIAGNOSTICS.
- CHARACTER CHARGES EQUATE TO ABOUT \$0.03 KILOCHARACTER, CHARGED TWICE (IN AND OUT OF NET) EQUALLING TOTAL CHARGE OF \$0.06 EQUIVALENT TO CONVENTIONAL CHARGING SCHEME.
- ONLY ABOUT 15 "FOREIGN HOSTS" CONNECTED AS OF 12/83. EXPECTED TO GROW TO 35-45 BY 12/84.
- ASSESSED TO BE ONLY A MODERATELY SUCCESSFUL OFFERING AND NOT UP TO EARLY INDUSTRY EXPECTATIONS.

INPUT



CYLIX

- PRESENTLY ORIENTED TO SMALL AND MEDIUM USERS, REVENUES ABOUT \$30 MILLION IN 1983.
- IS NOT SEEING ANY UNUSUALLY DEMAND FOR SDLC THOUGH AVAILABLE.
- REPRICING SEEMS AIMED AT ATTRACTING LARGER USERS.
- SELLS HEAVILY ON PRICE FROM TEN FIELD OFFICES.
- FEELS THAT SERVICE QUALITY PROBLEMS ARE OVERCOME AND IS PLANNING TO BE QUITE AGGRESSIVE.
- BELIEVES LACK OF AT&T "END TO END" IS A REAL OPPORTUNITY FOR CYLIX AND WILL DRIVE GROWTH.

INPUT

ADP AUTONET

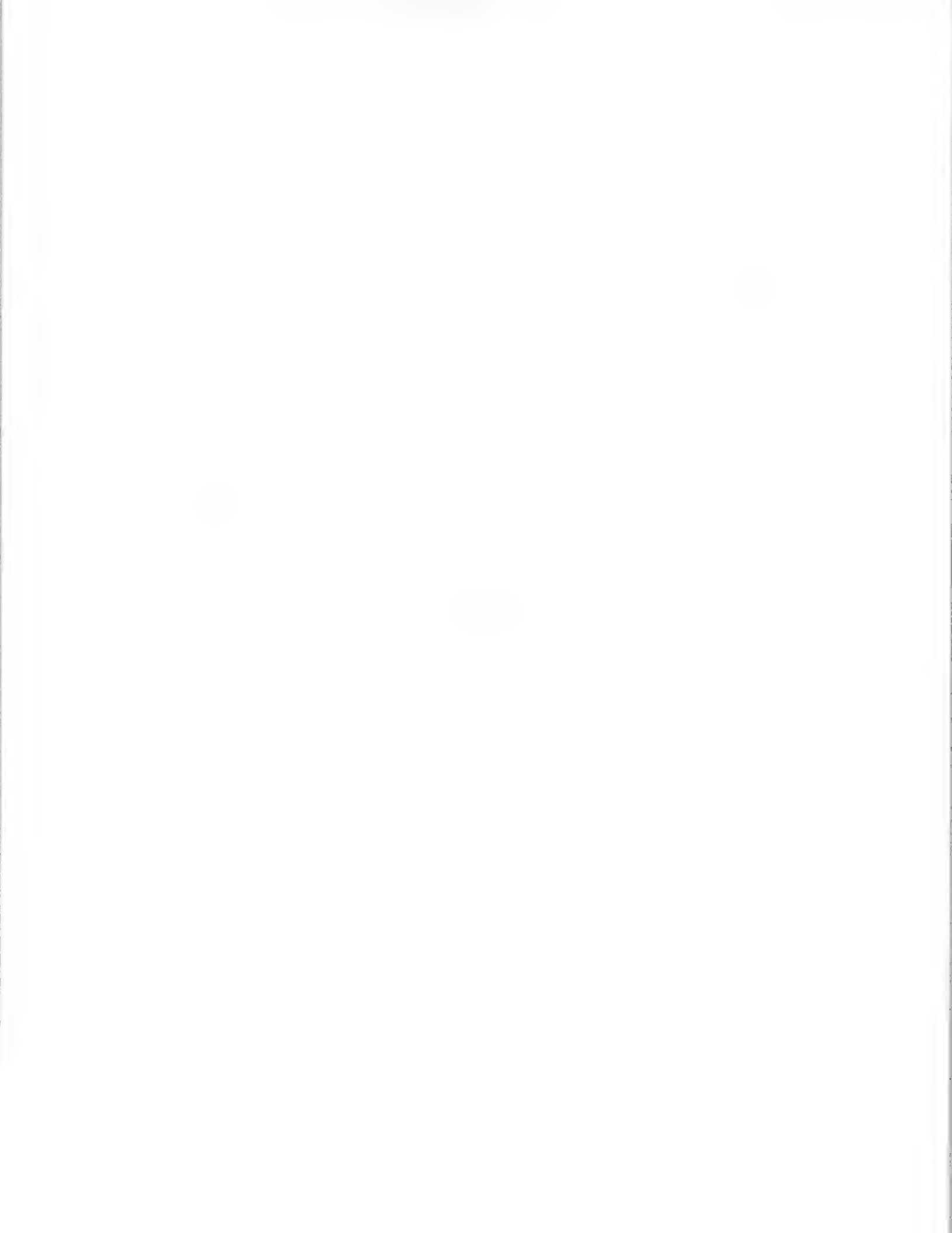
- NOT A PLAYER.
- ONLY SIX DEDICATED SALES PERSONS, SELLS A QUALITY NETWORK NOT PRICE.
- WILL BE ANNOUNCING 3270 SERVICE IN FALL.
- SEES OPPORTUNITY IN PC INTERCONNECTIONS.

INPUT

COMPUSERVE

- ANOTHER SECONDARY SOURCE.
- PRICED VERY COMPETITIVELY BUT OFFERS NO 3270 AND DOES NOT PLAN TO.
- EMPHASIS AREA IS POS VERIFICATION AND HAS NATIONAL DEAL WITH VISA.
- SEES BIG COMMUNICATIONS DEMAND AS SOURCE OF ITS GROWTH. NOT CONFIRMED BY FACTS.

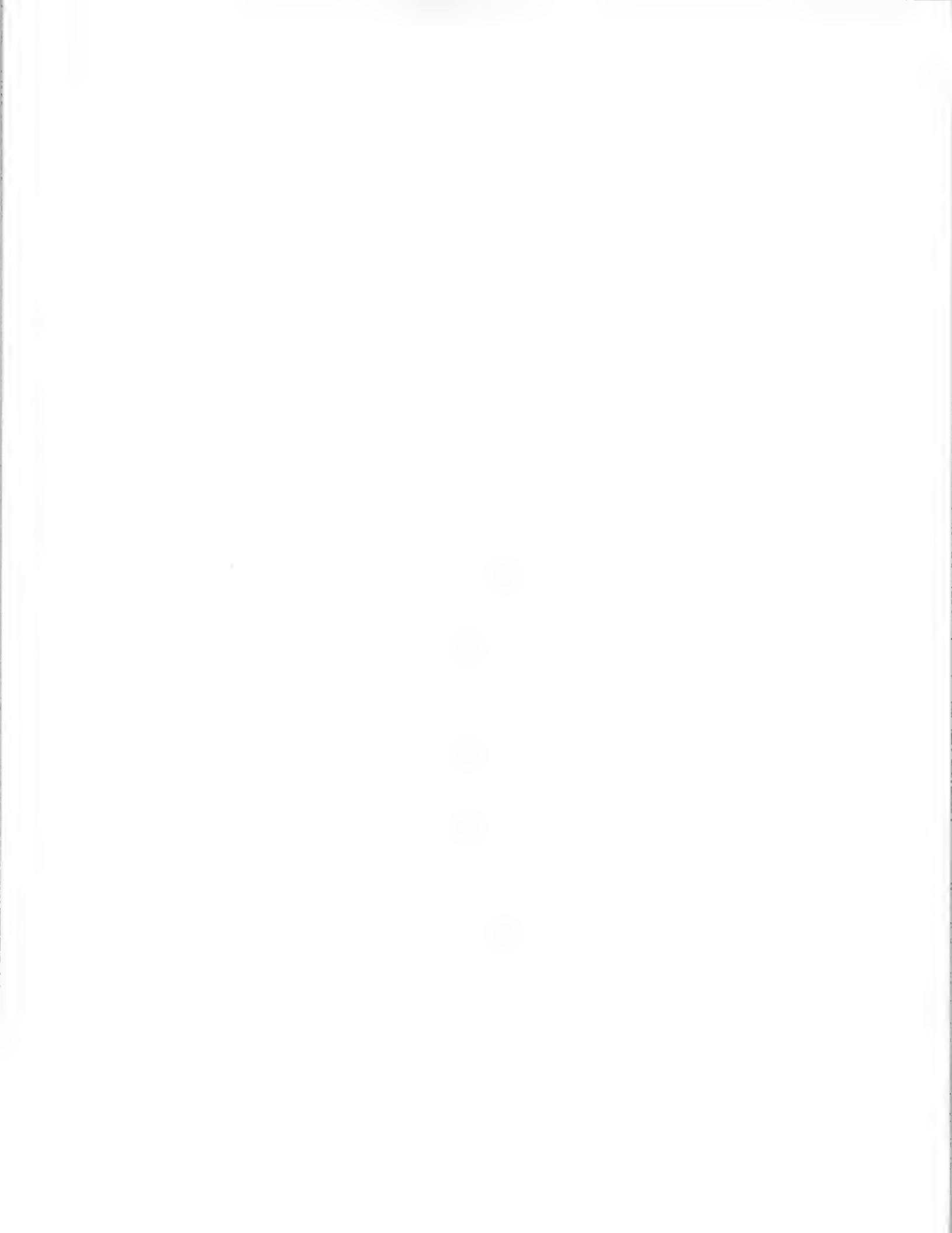
INPUT



CSC INFONET

- INTERESTING STRATEGY, EXPECTS REVENUES OF \$2-2½ MILLION FOR YEAR 1984 AFTER LATE 1983 START.
- EMPHASIZING INTERNATIONAL COMMUNICATIONS AND 3270/3780 TRAFFIC.
- SERVICE OFFERED IN 19 COUNTRIES.
- CLAIMS IBM COMPATIBLE PLUS INTERNATIONAL ACCOUNTS FOR HALF OF BUSINESS.
- PROVIDES A SINGLE BILL TO A SINGLE POINT DENOMINATED IN DOLLARS.
- SPREADING OUT TO GOVERNMENT NETWORKS, A SENSIBLE MOVE GIVEN THE CSC PROFILE.
- MIDDLE OF THE PACK PRICING WITH UNIFORM OFFSHORE RATES. STRONG DOLLAR AIDS THIS STRATEGY FROM A COST STANDPOINT.
- DISCOUNT SCHEDULE IS UNIFORM OFFSHORE.

INPUT



UNINET

- BIG NAME BUT MINOR MARKET POWER.
- COMPLETELY REVAMPED NETWORK EFFECTIVE JUNE 1984 AND INCREASED PRICES VERY SUBSTANTIALY.
- REVENUES QUITE LOW (SEE REPORT) BUT INPUT BELIEVES UNITED IS COMMITTED TO THE BUSINESS AND CAN TOLERATE LOSSES, AS CAN GTE.
- DESPITE COMMITMENT, UNINET MUST GROW BY A FACTOR OF 40 TO EQUAL TYMNET OR TELENET. THIS SEEMS UNLIKELY.
- PROBABLY MISSED FOREVER THE CHANCE TO BECOME MAJOR VAN VENDOR; WILL PERSIST INDEFINITELY IN THE SECOND TIER UNTIL THIS IS SWEEPED AWAY.

INPUT

VAN MARKET EXECUTIVE SUMMARY

PRIVATE LINE

- AT ABOUT TWENTY TIMES THE SIZE OF THE VAN MARKET INTERSTATE PRIVATE LINE MAY BE CONSIDERED THE ENVIRONMENT.
- GROWTH IN THIS MARKET HAS BEEN HIGHLY INFLATIONARY. THIRTY-SIX PERCENT (36%) OF REVENUE INCREASE 1977-1982 CAUSED BY PRICE INCREASES.
- MARKET IS HIGHLY SENSITIVE TO PRICE, GROWTH FLATTENING PRONOUNCEDLY WHEN SHARP INCREASES OCCURRED.
- INTERSTATE PRIVATE LINE A MAJOR COST COMPONENT IN VAN CHARGES AND VAN GROWTH TRACKS (AT A MULTIPLE) THE GROWTH IN PRIVATE LINE.
- VERY CLOUDLY FUTURE PICTURE FOR PRIVATE LINE PRICING DIMINISHES THE ABILITY TO FORECAST VAN GROWTH AND VAN EXPENSE STRUCTURES.

— INPUT —



ACCUNET

- ATTIS ACCUNET PACKET OFFERING HOBbled BY REGULATORY DOGFIGHTS, QUESTION OF WHO IT TRULY SERVES.
- ACCUNET PACKET A SERVICE FOR THE TRULY SOPHISTICATED AND AVAILABLE IN ONLY LIMITED (7) LOCATIONS.
- ATTIS PHILOSOPHY IS LET THE CUSTOMERS DRIVE THE MARKET; WILL EVENTUALLY OFFER LOW SPEED SERVICE DOWN TO 1200 BPS, PROBABLY BY 1986.
- DESIGNED TO BE THE PREMIER INTERCONNECT INTERSTATE SERVICE BUT WILL BOC'S GO ALONG WITH THIS? WILL PROBABLY ENCOURAGE "EQUAL ACCESS."

INPUT

NET 1000

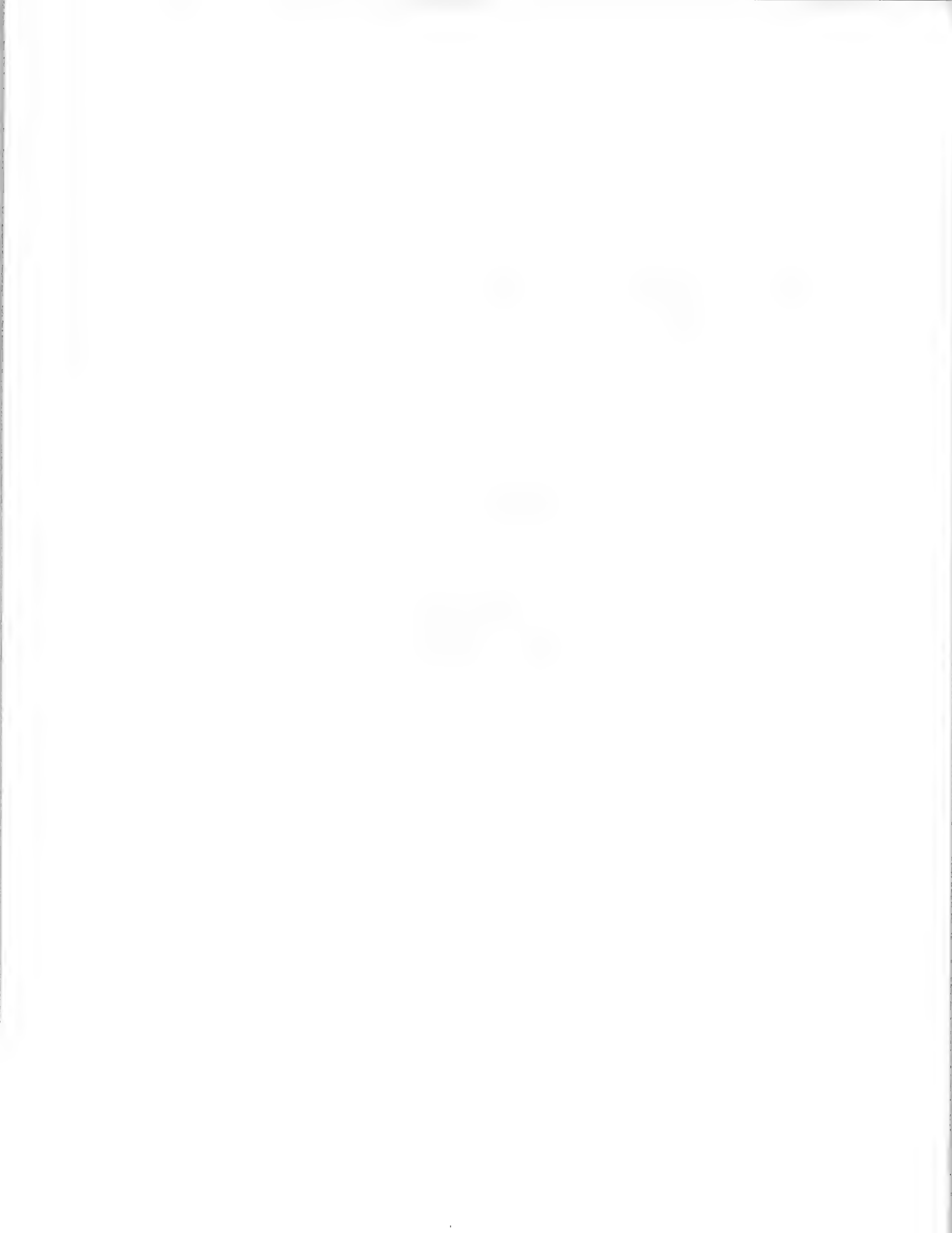
- NET 1000 NOT A PLAYER. A SOLUTION LOOKING FOR A PROBLEM TO SOLVE.
- STATIC IN TERMS OF DEVELOPMENT AND WORKING WITH THIRD PARTIES TO TRY TO FIND APPLICATIONS.
- SUFFERS FROM AN EXPENSIVE, TARIFF HERITAGE PRICING PHILOSOPHY AND VERY LIMITED DEVELOPMENT TOOLS.
- NET 1000 "KEYING" ON FINANCE AND TRANSPORTATION APPLICATIONS. APPS APPEAR TO BE COMING FROM FORMER 800 SERVICE AND OTHER AT&T SERVICES. NO CONQUEST APPLICATIONS: APPEARS TO BE EATING ITS OWN BACON.

INPUT

BELL OPERATING COMPANIES

- BELL OPERATING COMPANIES STAMPED INTO INTRA-LATA PACKET, REQUESTING PROTOCOL CONVERSION. PRICES LOOK CHEAP (ON THE SURFACE) AND MAJOR VANS SUCH AS TELENET ARE VERY CONCERNED, AS IS IBM, ET AL.
- A POTENTIAL INTERCONNECT OPPORTUNITY FOR THOSE WITHOUT TRAFFIC TO LOSE.
- LOCAL PACKET A WAY OF SHEDDING PRIVATE LINE HISTORICAL BURDEN.
- THESE ARE NOT LADT'S YET. ONLY OPERATING LADT IN FLORIDA HAS ONLY SYNC TRANSMISSION AT 1.2 AND 4.8 BUT IS VERY CHEAP AT \$28.50 MONTH AND \$0.65/KILOPACKET.
- CURRENT LADT CAPABILITY PROBABLY A TECHNOLOGICAL DEAD END GIVEN SPECIAL HARDWARE AND TERMINAL REQUIREMENTS. WILL REQUIRE SUBSTANTIAL REVISION TO MEET "REAL-WORLD" SPEEDS AND PROTOCOLS ON TERMINAL END.
- EXPENSES ARE MINIMAL FOR THESE BOC EXPERIMENTS IN LIGHT OF \$1-2 BILLION ANNUAL CONSTRUCTION BUDGETS.
- ACTIONS OF BOC'S MAY TURN VAN BUSINESS INTO A COMPONENT BUSINESS.
- BOC PACKETS WILL NEVER BE UBIQUITOUS BUT WILL CONCENTRATE IN MAJOR METRO AREAS.

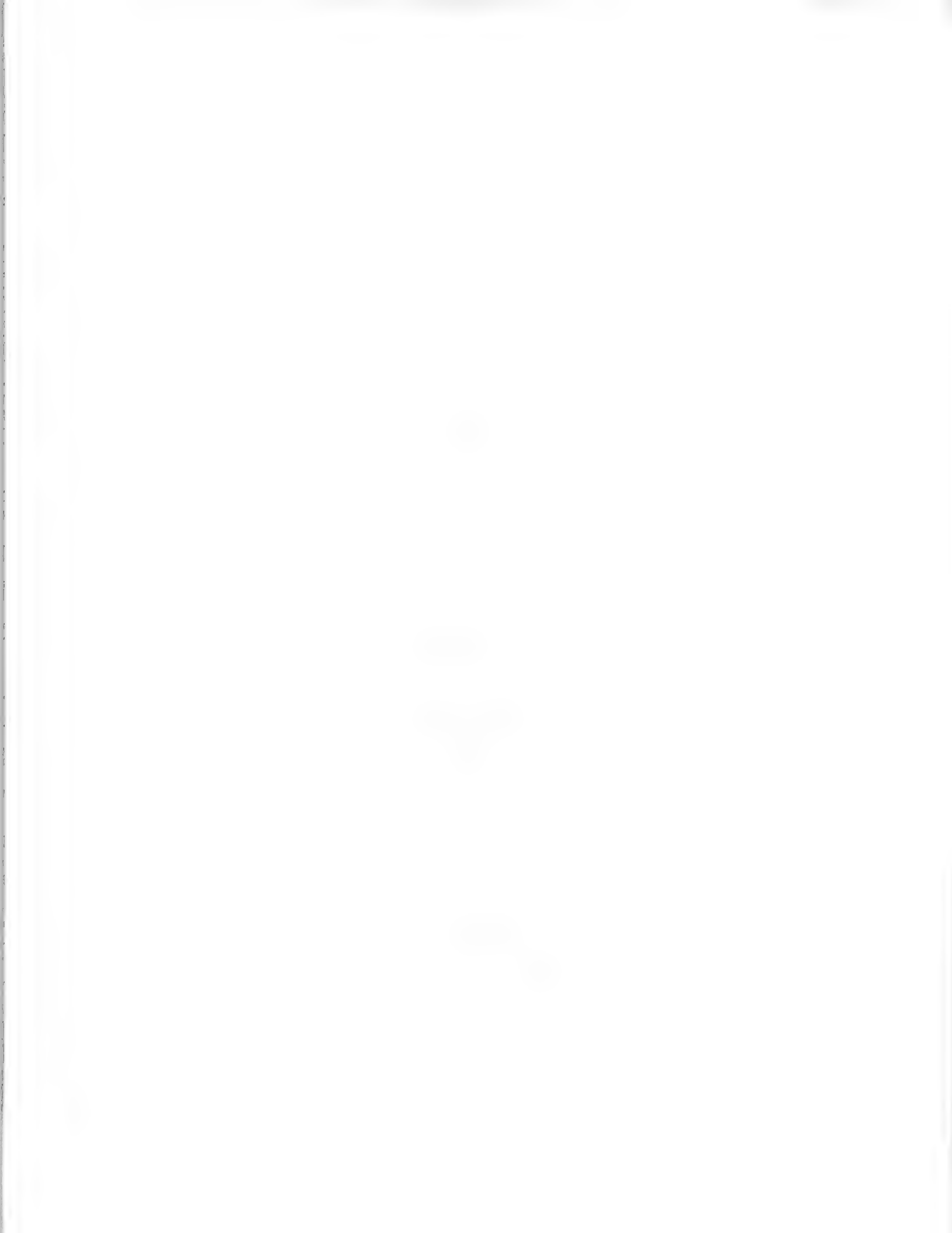
— INPUT —



TELENET

- TELENET GROWTH HAS RECOVERED IN 1984 OVER A SLOW 1983 BUT HAS NOT REACHED HISTORICAL LEVELS.
- HAVING DEMONSTRATED THE ABILITY TO BE "PROFITABLE" FOR THREE CONSECUTIVE QUARTERS, GTE HAS RENEWED FAITH IN TELENET.
- TELENET IS BEING PLAYED AS A "DEEP-POCKETS" BUSINESS. GTE HAS INVESTED MORE THAN \$350 MILLION IN EQUITY 1978-1982. REVENUE PER DOLLAR OF ASSETS LESS FAVORABLE THAN GTE'S TELEPHONE BUSINESS, A TRADITIONAL HEAVY CONSUMER OF CAPITAL.
- TELENET MAKING MOVES IN IMPROVED PACKET SWITCHES, MICRO-COMPUTER COMMUNICATIONS AND ELECTRONIC MAIL, BUT OF A MINOR NATURE COMPARED TO THE VOLUME OF UTILITY ASYNC TRAFFIC. DOES NOT EMPHASIZE 3270 COMMUNICATIONS, OFFERS AS AN ACCOMODATION.
- TELENET A FORMIDABLE COMPETITOR DUE TO THE COMMITMENT AND FINANCIAL STRENGTH OF ITS PARENT. POTENTIAL STRENGTH IN BASE TRANSMISSION PLANT OF GTE SPRINT AS WELL.

— INPUT —



General Electric Information Services Company

401 N. Washington Street, Rockville, Maryland 20850 (301) 340-4000

July 9, 1984

Mr. Don Fostle
INPUT
Park 80 Plaza West-1
Saddlebrook, NJ 07662

Dear Mr. Fostle:

Thank you for the informal status review of Input's VAN Competitive Analysis study. While we are behind the planned schedule, I feel the project is moving forward and anticipate we will be able to close before the end of July.

While we discussed the items required for closure of the contract, they are provided below for clarification:

- o Analysis of GTE/Telenet
 - Organizational Structure
 - Technology/Capabilities
 - Deployment
 - Statistical Information
 - Operational Profile
 - Financial Data (P&L)
 - Marketing Approach
 - Future Product Plans
- o Analysis of Uninet
(follow Telenet detail)
- o Provision of Public Information for
each Vendor profiled
(Advertising, Documentation, Price Sheets)
- o Additional cost detail for the vendors
profiled

The required delivery date on the contract has been revised from June 30, 1984 to July 30, 1984.

Please do not hesitate to call if you have questions on any of the above items.



General Electric Information Services Company

Page 2

We should also schedule a date for the final report presentation.

Regards,

A handwritten signature in cursive script that reads "Christine B. Dunlap".

Christine B. Dunlap
VAN Tactical Marketing

U

AT&T NET 1000 SERVICE

Product Description

CP.n-00

<<DATE>>

<<ISSUE>>

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1. INTRODUCTION

1.1 OVERVIEW

The Product Description describes AT&T Information Systems Net 1000 Service and contains information included by reference in the AT&T Information Systems Net 1000 Service Agreement. The information contained in this document is intended for individuals who deal with the Service Agreement.

This document is organized in the following five Sections:

1. INTRODUCTION - describes the Product Description's intent and content, and gives the hours of operation for Net 1000 Service.
2. CAPABILITIES - describes the capabilities of Net 1000.
3. PACKAGES - describes the software packages available for Net 1000.
4. SECURITY - describes Net 1000 security.
5. SUPPORT SERVICES - describes Net 1000 customer support.

1.2 HOURS OF OPERATION

Except for certain holidays, Net 1000 Service is available to customers 20 hours a day, seven days a week. Hours of operation are from 6 a.m. to 2 a.m., eastern time.

The Customer Software Service Center is available Monday through Friday to support software development activities. Hours of operation are from 7 a.m. to 9 p.m., eastern time.

AT&T NET 1000 SERVICE
Product Description

Chapter 1 contains the following information modules:

<i>Filename</i>	<i>Issue</i>
%W%	
%W%	
%W%	
%W%	

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CP.n-00

2. CAPABILITIES

2.1 OVERVIEW

Net 1000 has the following major capabilities:

- Customers can access Net 1000 at Service Points distributed throughout the country. Terminal and host computer access is provided to customers at these Service Points.
- Data processing and storage capabilities are available at each Service Point, as well as an information movement capability between Service Points.
- Customers can create their own sub-networks that have data processing, storage, and information movement facilities. Customers are billed only for Net 1000 resources used by the sub-networks.
- Customers can satisfy special networking needs by developing and installing their own application software. Software development facilities are provided as part of Net 1000 Service.

2.2 ACCESS TO NET 1000 SERVICE

Net 1000 supports three types of terminal interfaces, including plug-compatible equivalents. The following is a listing of the types with examples of devices:

1. Asynchronous Contention

- TELETYPE* Model 33/35/37/43
- TELETYPE* Model 33/35/37/43
- IBM 3101
- VT100

(This space intentionally left blank.)

* Registered Trademark of Teletype Corporation

2. Synchronous contention

- IBM 3780
- IBM 3275

3. Synchronous polled

- IBM 3270 Type

Net 1000 supports three types of host interfaces by emulating terminal devices. The following is a listing of the types with examples of devices:

1. Asynchronous Contention

- ASCII Asynchronous

2. Synchronous Contention

- IBM 3780

3. Synchronous Polled

- IBM 3270

Private (analog and digital) and public (dial-in and dial-out) access to Net 1000 are available. Line speeds supported are 110-9600 bps for private and 110-4800 bps for public lines. Private lines may be point-to-point or multipoint; refer to Tables 2.1 and 2.2 for more specific information.

The customer provides the following premises equipment:

- terminals and/or host computers compatible with Net 1000.
- modem or digital interface equipment.

(This space intentionally left blank.)

Table 2.1 SYNCHRONOUS ACCESS OPERATING CHARACTERISTICS

Type of Line, Data Set, and Line Speed	Type of Interface Supported		
	3780*	3275	3270**
<i>Private (Analog)</i>			
201, 2024 - 2400 bps	x		x
208, 2048 - 4800 bps	x		x
209, 2096 - 7200, 9600 bps	x		x
<i>Private (Digital)</i>			
500A - 2400, 4800, 9600 bps	x		x
500B - 2400, 4800, 9600 bps	x		x
<i>Public (Dial-In)</i>			
212 - 1200 bps	x	x	
201 - 2400 bps	x	x	
208 - 4800 bps	x	x	
<i>Public (Dial-Out)</i>			
212 - 1200 bps	x		
201 - 2400 bps	x		
208 - 4800 bps	x		

* point-to-point only

** point-to-point and multipoint

(This space intentionally left blank.)

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Table 2.2 ASYNCHRONOUS ACCESS OPERATING CHARACTERISTICS

Type of Line, Data Set, and Line Speed -----	ASCII Terminal -----	ASCII Host -----
<i>Private</i>		
108 - 110, 300 bps	x	
108 - 150 bps	x	
202T - 600 bps	x	
202T - 1200 bps	x	x
<i>Public (Dial-In)</i>		
103 - 110, 150, 300 bps	x	x
212 - 110, 150, 300, 1200 bps	x	
<i>Public (Dial-Out)</i>		
103 - 110, 150, 300 bps	x	
212 - 110, 150, 300 bps	x	
212 - 1200 bps	x	x

2.3 DATA PROCESSING, STORAGE, AND INFORMATION MOVEMENT

The following paragraphs describe the data processing, storage, and information movement capabilities of Net 1000.

2.3.1 Data Processing

Programs are installed at Service Points. Program execution begins because of: a call from a terminal, host, or another program; arrival of a message; or an explicit "run" request from another program.

Processing is available to customers on demand. Two grades of program processing are offered: interactive (foreground) and non-interactive (background). Non-interactive programs that can run asynchronously, in the background, cost less to execute than interactive programs.

Customers can develop software to meet special requirements using the following programming languages:

- COBOL (ANSI X3.23-1974), modified to interface with the Net 1000 operating system.
- Forms Definition Language (FDL).
- Command Definition Language (CDL).

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Standard software packages are available from AT&T Information Systems that provide Net 1000 customers with various functions; refer to Section 3, PACKAGES.

2.3.2 Storage

Both program and data storage are available at Service Points.

Data storage is available in two forms: reserved, which is dedicated to a customer; and demand, which is used only when needed. Programs can read, write, change, or delete stored data. File organization can be sequential or indexed sequential.

A hierarchical file directory capability is provided.

2.3.3 Information Movement

Customers can move information between addressable programs and ports. Two forms of information movement are available:

1. Call service for session-oriented (two-way) communications.
2. Message service using store-and-forward (one-way) communications. Three grades of message service are offered; priority, standard, and delayed. Confirmation of message delivery and earliest time of delivery options are available.

Three forms of data movement are available:

1. Common mode. Net 1000 provides code, format, and speed conversion for a device with operating characteristics similar to an unformatted teleprinter.
2. Class-Specific mode. Net 1000 provides code and speed conversion.
3. Transparent mode. Net 1000 provides speed conversion only.

2.4 SUB-NETWORKS

Net 1000 has security and billing capabilities that let customers create their own sub-networks.

Ownership of each program and port in a sub-network is established by the customer using Customer Account (CA) and Service Identifier (SID) codes. The CA and SID are supplied to the customer by AT&T Information Systems during initial provisioning of the customer's Net 1000 Service.

Identifier (ID) codes and passwords are used, in addition to the CA and SID, if customers access Net 1000 through public ports. ID and password authorization are provided by the Logon Application Package (LAP), which is

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available to customers using private ports; refer to Section 3, PACKAGES. AT&T Information Systems supplies the ID, but the customer controls the passwords used.

Billing for both intercompany and intracompany use of Net 1000 resources is determined by each program's CA and SID execution options, which are selected by the customer. In addition, customers can use their own charge codes to allocate billing among cost centers.

2.5 APPLICATION SOFTWARE

A customer's special requirements can be met using application programs that execute within the network. Customers can develop their own application programs using a combination of on-network and off-network software development facilities. These facilities let customers create, compile, link, install, test, and debug application programs.

2.5.1 Programming Languages

Net 1000 COBOL is the principal programming language used for creating customer application programs. Net 1000 COBOL is a subset of ANSI X3.23-1974 COBOL with I/O and communications modules replaced by Net 1000 System Services, which are described below.

Two additional languages support specific functions: a Forms Definition Language (FDL), used for creating and validating customer-specified forms at terminals; and a Command Definition Language (CDL), used for creating customer-specified interface commands.

2.5.2 Net 1000 System Services

The Net 1000 COBOL CALL statement provides the following System Services:

- File I/O Service - provides access to the file system letting customers create and delete files, and create, delete, and change records within the files.
- Call Communications Service - provides the ability to make, accept, or end calls, and to send and receive data.
- Message Communications Service - provides the ability to create, send, receive, and release messages, and to send and receive files through the store and forward facility.
- Program Control Services - provides program control functions, such as event recognition, program start, and program stop.
- Customer Control Services - lets customers administer and control their network resources.

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- Standard Device Management Module - permits communicating with stations (terminals). This service simplifies terminal I/O by handling device dependencies.
- Time Services - permits a program to obtain date and time.
- Net 1000 Editor - provides access to text files and in-memory buffers.
- Net 1000 On-Line Documentation Facility - provides on-line information about warning and error messages, commands, and Net 1000 terminology. Customers can use the standard contents of OLD, or they can change OLD's contents to meet their own requirements.
- Net 1000 Command Parser - parses a command string and accesses items, such as options and arguments. Commands can be Net 1000 standard, or they can be defined by the customer using the Command Definition Language (CDL).
- Forms Library - reads the translated forms file, and displays, collects, and validates the forms data built with the Forms Definition Language (FDL).

AT&T NET 1000 SERVICE
Product Description

Chapter 2 contains the following information modules:

<i>Filename</i>	<i>Issue</i>
2W%	
2W%	

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3. PACKAGES

3.1 OVERVIEW

This section briefly describes each of the standard software packages available to Net 1000 customers. These packages, supplied and maintained by AT&T Information Systems, let customers use Net 1000 resources without developing their own application software.

3.2 ELECTRONIC DOCUMENT COMMUNICATIONS (EDC)

EDC provides a message service capability within Net 1000, and between Net 1000 and DIMENSION System 85. EDC handles message preparation, transmission, reception, storage, retrieval, and management.

3.3 FORMAT TRANSLATOR PACKAGE (FTP)

FTP lets customers connect inexpensive asynchronous video display units and teleprinters to host computer applications designed to interface with IBM 3270-type terminals. FTP can switch dynamically among applications on the same host, or on different hosts, regardless of the host location.

3.4 FILE ROUTING PACKAGE (FRP)

FRP lets customers transfer one or more files from a host computer or workstation to Net 1000 storage areas at local or remote Service Points. FRP also lets customers transfer files from local Net 1000 storage areas to their customer premises equipment.

3.5 STANDARD LOGON APPLICATION PACKAGE (LAP)

LAP screens customer operators when they log on to Net 1000 and establishes a billing entity after a logon is successfully completed. LAP must be used with public ports and is an option with private ports.

3.6 STANDARD CUSTOMER CONTROL PACKAGE (SCCP)

SCCP lets customers manage and control their Net 1000 resources, such as application programs and Service Point facilities. SCCP gives the customer Administrator or Application Developer access to Net 1000 utilities and command routines.

3.7 STANDARD HUNT GROUP PACKAGE (SHGP)

SHGP automatically queues and routes incoming calls to the first available, non-busy station. SHGP also records statistics that help customers efficiently allocate port facilities.

3.8 STANDARD STATION PARAMETER HANDLING PACKAGE (SPHP)

SPHP lets customer terminal operators display and set station parameters.

3.9 STANDARD SOFTWARE SUPPORT PACKAGE (SSSP)

SSSP is available to customers at the Net 1000 Customer Software Support Center (CSSC). This package gives customer programmers an interface to the application program development facilities available at the CSSC.

3.10 ON-LINE DOCUMENTATION (OLD)

OLD provides customers with on-line information about Net 1000 commands, warning and error messages, and Net 1000 terminology. Customers can change OLD to meet their own needs by replacing or adding to the package's standard content.

3.11 NET 1000 EDITOR

The Net 1000 Editor lets customers create, change, or delete the contents of files and in-memory buffers. The Editor can be invoked directly, from AT&T-supplied packages, or from a customers own packages.

AT&T NET 1000 SERVICE
Product Description

Chapter 3 contains the following information modules:

<i>Filename</i>	<i>Issue</i>
%W%	
%W%	

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4. SECURITY

4.1 OVERVIEW

Net 1000 lets customers control the authorization (screening) process that governs access to Net 1000 Service. This is done using two Net 1000 codes:

- CUSTOMER ACCOUNT (CA) CODE - a unique 12-character alphanumeric code established by service order.
- SERVICE IDENTIFIER (SID) CODE - a 16-character alphanumeric code consisting of the 12-character CA and an appended 4-character numeric code.

In addition to being used for authorization, the CA is used to determine to whom a bill for services is rendered.

4.2 PROGRAM EXECUTION AUTHORIZATION

A CA/SID pair is assigned to a program when it is installed. The CA and SID can be used independently or in combination to control program execution. The CA determines who is billed for executing the program, and who is billed for network resources used by that program.

4.3 FILE ACCESS AUTHORIZATION

Customers create Net 1000 data files, and file access authorization rights are established when files are created. File access authorization rights are:

- read
- write
- change
- delete

A CA/SID pair is assigned to a file when it is created. When a file is accessed the assigned CA/SID is compared to the calling program's CA/SID to determine if access is allowed. File access authorization can be set up to permit specific access rights, such as reading the file, and to deny other rights, such as deleting the file.

AT&T NET 1000 SERVICE
Product Description

Chapter 4 contains the following information modules:

<i>Filename</i>	<i>Issue</i>
%W%	
%W%	

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5. SUPPORT SERVICES

5.1 OVERVIEW

AT&T Information Systems provides support services to help customers successfully implement and operate their Net 1000 resources. These services include:

- ACCOUNT TEAM SUPPORT
- NETWORK MANAGEMENT
- ACCESS MANAGEMENT
- EDUCATION

5.2 ACCOUNT TEAM SUPPORT

An Account Team, consisting of an Account Executive (AE), a Communications System Representative (CSR), and a group marketing specialists and technical experts, is assigned to each Net 1000 customer. Members of this Team provide technical expertise in data communications, information on Net 1000 customized programming, and assistance with Net 1000 application program development.

Account Teams are responsible for implementing Net 1000 Service and ensuring that the Service is operating satisfactorily. These Teams help customers determine how Net 1000 can provide the greatest benefit to their business.

Account Teams act as a liaison between customers and AT&T Information Systems in administering Net 1000 Service Agreements. These Service Agreements specify terms and conditions, responsibilities, warranties, and liabilities.

5.3 NETWORK MANAGEMENT

The Customer Network Manager (CNM) is the customer's principal contact for Net 1000 Service operation and support. The CNM is responsible for relieving customers of the problems associated with managing a complex communications system.

Customers report problems to the CNM at the Customer Network Management Center (CNMC) by telephone or through Net 1000 itself. The CNM verifies that a problem exists, and if it is within Net 1000, the CNM refers the problem to the appropriate personnel for repair. If the problem does not exist in the Network, the CNM works with the customer to correct the problem.

Some of the other services provided by the CNM are installing and removing application programs, obtaining status reports, and maintaining efficient operation of the Service.

CNM support is available to customers during the service interval.

5.4 ACCESS MANAGEMENT

As an option, AT&T Information Systems will provide Access Management services for customers who select private access to Net 1000. These services include:

- Designing the network access facility using either analog or digital methods, depending on customer preference and common carrier availability.
- Service provisioning the facility at the customer premises, including coordinated testing with AT&T Information Systems-provided customer premises data sets.
- Monitoring the facility's circuits for interruptions or outages, and repairing outages, which includes end-to-end testing between the customer and Net 1000 premises.

With Access Management services, AT&T Information Systems assumes all responsibilities for dedicated common carrier facilities connected to customer premises. A standardized distance-sensitive rate plan provides nation-wide pricing for both intrastate and interstate access.

5.5 EDUCATION

Documentation and training are available to Net 1000 customers. The documents describe Net 1000 resources from a customer's point of view. Available documents contain general information as well as the detailed information necessary for using Net 1000 resources. The training curriculum includes familiarization seminars as well as technical courses. The Account Team helps customers with their educational needs.



AT&T

Information Systems

NET 1000 OVERVIEW





INTRODUCTION

Today, there are many networks available to the business community. These networks are designed to provide solutions to both data communication and business problems. However, users often find that the network that initially provided them with a solution may not continue to satisfy their needs as they look to the future.

The problem is usually rooted in the manner in which information is managed and the specific needs of the user. The current trend toward distributed business applications has created a new type of user for these applications. This user may be required to perform a number of local processing functions and communicate either within the company or between companies. The process by which information is handled and displayed is extremely important to this end-user. If that process is either inadequate or inefficient, the end-user performance is affected. Consequently, a network that is able to handle a variety of business problems must be both flexible and able to provide the necessary facilities that will allow end-users to accomplish their tasks in a satisfactory manner. Net 1000 is such a network.

Some users are primarily interested in transport. These users employ networks to move information from one location to another. Such users typically want a network transport mechanism to transfer files or messages to one or more destinations. In accomplishing this task, the network should provide several grades of service depending upon how rapidly a message or file is to be delivered. There should also be some mechanism to confirm that a file or a message has been delivered. In addition, many companies already have their own corporate networks and may need to expand these facilities to transport information. Net 1000 provides these capabilities.

Users are often concerned about adequate storage for their programs and files. A network with storage capabilities has the advantage of offering users greater flexibility. Net 1000 provides network storage.

Storing proprietary programs and files in a network or providing access to data in host computers requires a security mechanism to protect these resources. Net 1000 provides an authorization scheme that allows customers to protect their resources.

To readily accommodate today's business community, users need a network that is capable of providing an assortment of software programs and tools to enable them to develop their own applications. Many users also require a network that allows these programs to be used on an inter-company basis. Net 1000 provides such facilities.

Any business that decides to use a network, needs a strong support team behind it. The company offering this service should have a reputation for providing reliable customer support. AT&T Information Systems is such a company.

The AT&T Information Systems' Net 1000 Service is a shared, distributed, customer-programmable, intelligent data communications network that addresses all of the requirements mentioned above. Net 1000 offers the business community a communication environment that can be tailored to meet users' current and future needs.

The Net 1000 Service is currently being offered in many metropolitan areas, and by mid-1984, customers will be able to access Net 1000 in all areas of the country (see Figure 1).

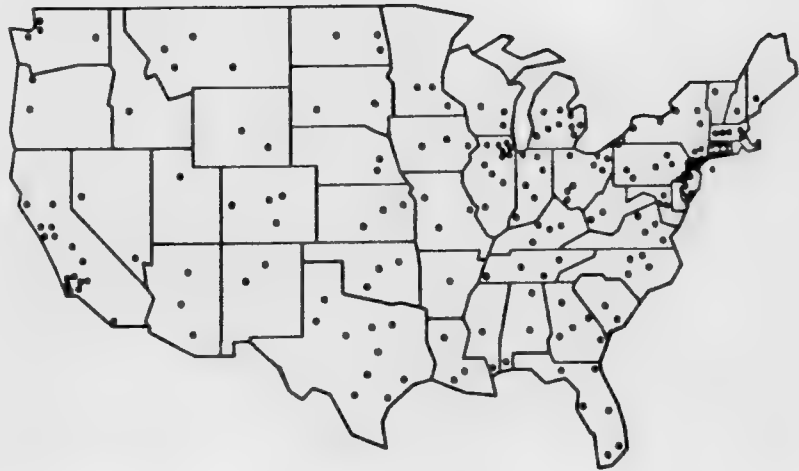


Figure 1

ACCESS

Net 1000 supports a broad variety of general purpose terminals and host computers. Customers connect their terminals or host computers to Net 1000 at access ports. These access ports are located at Service Points throughout the country. To reach an access port, a user can either dial-in, lease, or purchase access lines between their premises and Net 1000. These access lines can be acquired from any common carrier.

Access ports have both a physical and a logical component (see Figure 2). The physical component, called the port interface, has information associated with it that allows it to serve the particular line to which it is connected. The logical component, called the station facility, has information on the characteristics of a particular device to which it is connected.

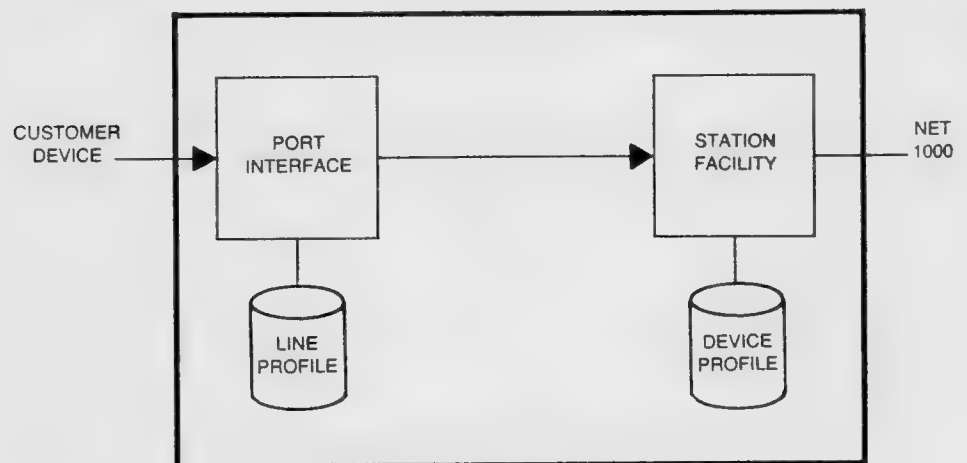


Figure 2

Net 1000 supports three classes of general-purpose terminals: asynchronous contention, synchronous contention, and synchronous polled.

A user's host computer communicates with Net 1000 as though it were communicating directly with a terminal or cluster controller. Net 1000 currently pro-

vides ASCII asynchronous emulation and synchronous contention (IBM 3780) and synchronous polled (IBM 3270) emulation for host computers.

From a station facility, users can access programs residing within the network or other station facilities. Figure 3 illustrates this concept.

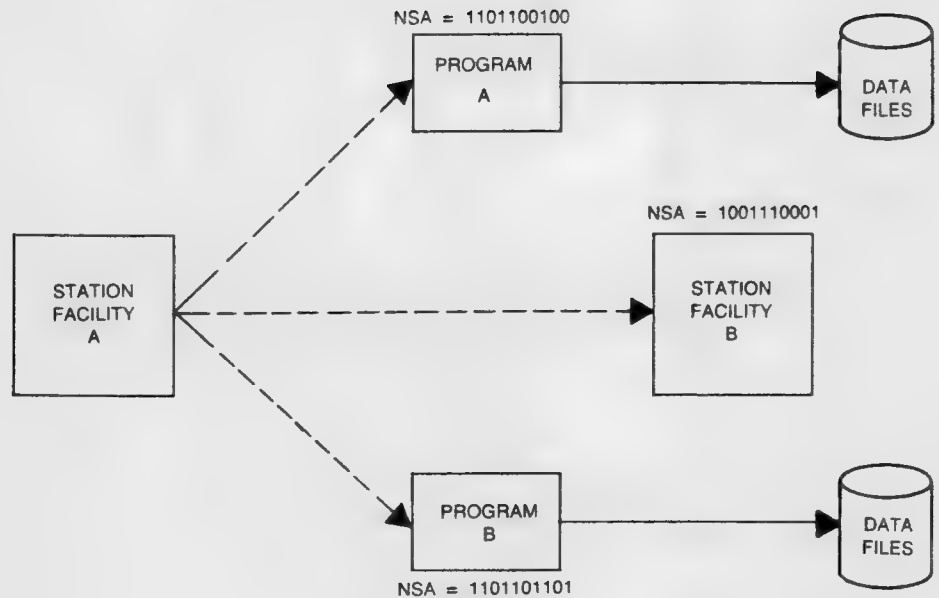


Figure 3

NETWORK STORAGE

Net 1000 allows customers to store both programs and data through Service Points. Storage is allocated on a contract basis and can later be adjusted according to actual usage.

A customer reserves program storage to store application programs that execute on Net 1000. Data storage can also be reserved to hold customer files. In addition to the data storage reserved by

contract, Net 1000 users may elect to have "demand storage" available in case they experience "peak demand" periods and exceed their allocated storage.

Net 1000 files may be either sequential or indexed sequential. File permissions (READ, WRITE, DELETE, and CHANGE) can be set for each file during creation or as required.

INFORMATION MOVEMENT

Net 1000 provides both a call service and a message service for transporting data between station facilities and programs within or between Service Points.

Call service is a two-way, interactive communications

capability which maintains a connection between station facilities or programs either within a Service Point or between Service Points. (see Figure 4).

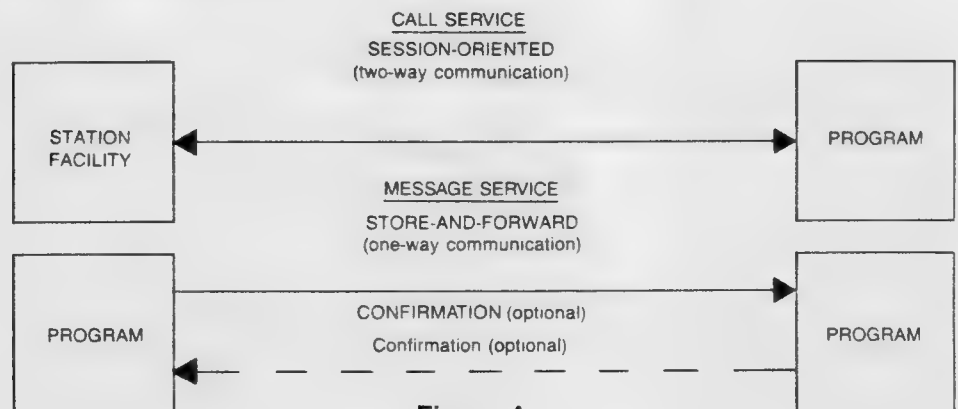


Figure 4

INFORMATION MOVEMENT (continued)

Message service is a one-way store-and-forward capability which is used to move information between programs or to files. The customer selects the grade of service (priority, standard, or delayed) and the delivery options. The grade of service selected is based on when information is expected. If a user selects the confirmation delivery option, Net 1000 sends a message of the same service grade as the original message, indicating that delivery of the message or file was either successful or unsuccessful. If the earliest-delivery-time option is chosen, the message or file is not delivered before the time specified.

The movement of data between both similar and dissimilar devices on the network occurs in three modes: Common Mode, Transparent Mode, and Class Specific Mode. Common Mode transports data in unformatted ASCII. Net 1000 converts code, format, and speed as required in Common Mode. In Class Specific Mode, data is transported for a specific type and class of station supported by Net 1000. Net 1000 provides both code and speed conversion in Class Specific Mode. Net 1000 also accepts data in Transparent Mode recognizing no control characters and providing only speed conversion.

ACCESS TO DEDICATED NETWORKS

Net 1000 allows private or dedicated network users to access its facilities. Such a configuration enables dedicated network users

to extend their capabilities and use the full range of services provided by Net 1000.

COMMUNICATIONS PROCESSING

Net 1000 allows many application programs to operate both concurrently and interactively. A Net 1000 application program executes after being accessed through either a call transfer or store-and-forward transfer.

The customer determines whether an application program executes as a multiple-image program or as a single-image program. A single-image program can handle multiple simultaneous

incoming calls or store-and-forward transfers. The customer specifies the number of simultaneous incoming requests a program can handle. A multiple-image program can generate a new image each time the program is required to execute. The customer also specifies the number of images a multiple image program can generate. Application programs can be either interactive or non-interactive.

NETWORK SOFTWARE

Programs in Net 1000 are structured in a layered fashion (see Figure 5). A number of standard application programs are provided to allow users to begin using Net 1000 with a minimum of

effort. A user's own application programs also reside in the application layer. All Net 1000 application programs have access to a library of Net 1000 utilities.

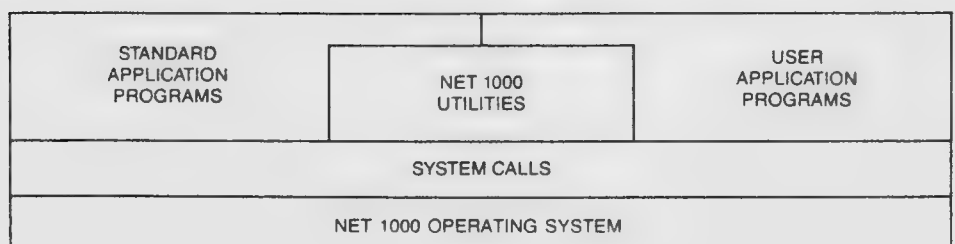


Figure 5

STANDARD APPLICATION PROGRAMS

The Net 1000 operating system provides the application layer with a multiprocessor environment and a number of services such as file management, device management, and network communications. These services are provided to the application layer by a set

of system calls. In addition to providing these services, the Net 1000 operating system is responsible for protecting network resources against unauthorized use.

Net 1000 offers a set of standard application programs that can be used by the customer, either as standalone programs, or in conjunction with other programs. A brief description of the primary Standard Application Programs is provided below:

1000 users to prepare and transmit messages to other locations on the network. This program also enables users to communicate with other customer premises equipment such as AT&T Information System's DIMENSION® /System 85 (see Figure 6).

- An electronic document communication program allows Net

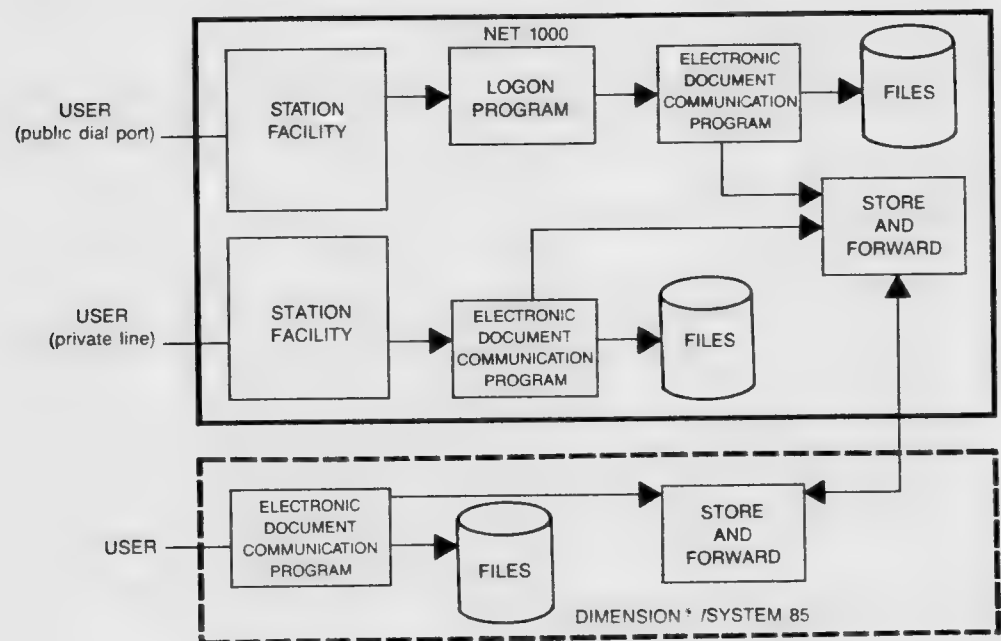


Figure 6

- An IBM-3270 format translation program allows customers to interface inexpensive asynchronous CRTs and teleprinters with host computers that normally interface with IBM 3270-type formatted terminals. It also allows users to dynamically switch between such terminals on the same host or on different hosts, regardless of location, by using a menu-driven authorization interface which is under the control of a customer administrator.
- A host-network file distribution program enables customers who provide information to network end-users to download information from a host database to a Net 1000 Service Point. From that Service Point, information can be obtained by the customer's end-users. Figure 7 illustrates this concept.
- A file transfer program provides customers with the ability to move files from host computers or 3780-type work-stations to

STANDARD APPLICATION PROGRAMS (continued)

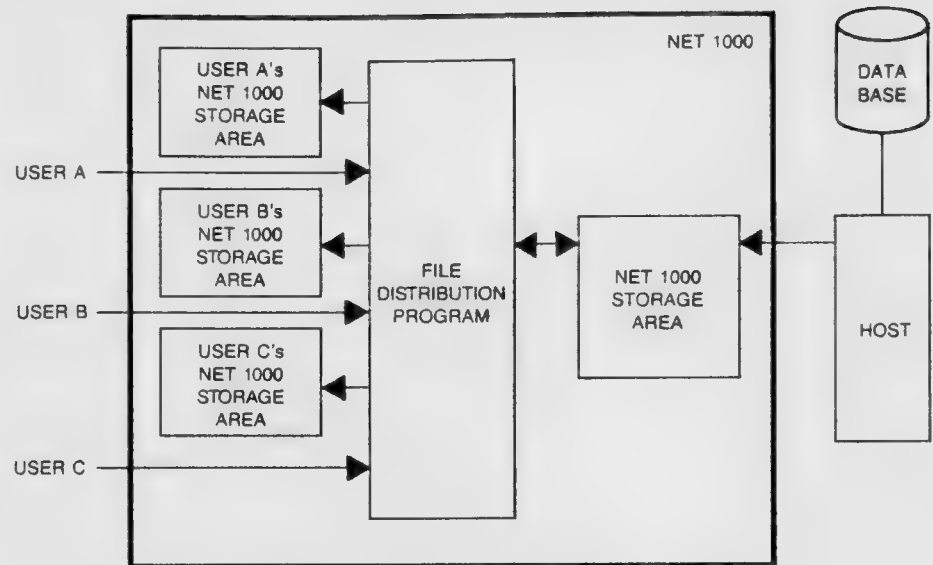


Figure 7

Net 1000 storage areas on local or remote Service Points (see Figure 8).

- A security program provides a network logon procedure for customers. Users are required to specify their own individual user-id's and password before they are allowed access to the network. This program is required with all dial-in ports and may be used optionally with private-line ports.
- A control program is provided which allows customers to manage their Net 1000 network resources through designated terminals. Customers can execute control commands to initialize, monitor, maintain, and change how their network resources are utilized.
- A routing program may be used to distribute the network load efficiently. This program allows information to be routed to other station facilities.
- A parameter handling program is provided which allows users to display and alter station parameters.
- An application development interface program provides the application programmer with an efficient, flexible interface to build customized user applications.
- A network editor that allows the user to create, modify, or delete files.
- An on-line documentation program provides users with on-line information about Net 1000 commands, errors, and terms. This program can also be adapted by customers to meet their specific needs.

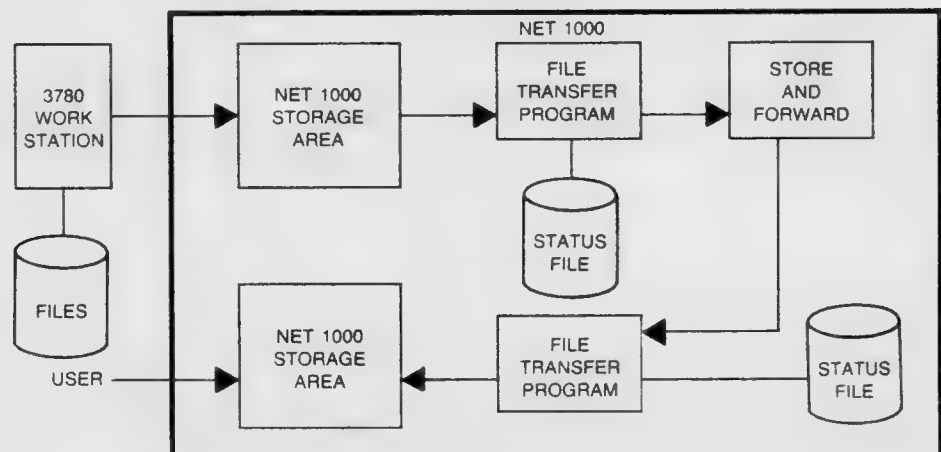


Figure 8



DEVELOPING APPLICATION PROGRAMS ON NET 1000

Net 1000 provides a program development environment facility that allows customers to develop their own application programs. Customers can create, compile, link, install, test and debug their application programs on Net 1000. Since Net 1000 is targeted for the business community, COBOL has been selected as the initial program development language. Net 1000 COBOL is a subset of ANSI X.23-1974 COBOL where the I/O and communications modules have been replaced with a group of call functions referred to as COBOL Services.

The Net 1000 COBOL Services provide file management, network communications, and device management. A forms service that enables a program to display forms on an IBM 3270 terminal, is included. A number of control functions are also provided to control the execution of a program, obtain information about the executing image of the program, and allow program tracing. A Net 1000 command parser is also available to help parse and execute user-defined commands.

Net 1000 users can develop their own applications on-line through Customer Software Support Centers (CSSC) that are located at special Service Points. Using these facilities, application programs can perform the following tasks:

- Create and modify COBOL application source code using an editor program.
- Create forms and/or customized Net 1000 commands.

RESOURCE PROTECTION

The network protects its resources against unauthorized access by assigning each resource two authorization parameters: a Customer Account (CA) and a Service Identifier (SID). The CA identifies who pays for the execution of programs and who receives the information. The SID is used to group resources together.

- Translate the source files into COBOL data structures.
- Compile COBOL application source files into object modules that can then be linked into an executable load module suitable for installation in the network.
- Install and test the executable load modules at the CSSC without network involvement and without affecting the day-to-day operations of the customer's existing subnetwork.
- Do traces, symbolic dumps, and measure resource requirements during testing.

Net 1000 also includes an off-line software development facility known as the Unit Test System (UTS). This facility:

- Executes on an IBM host computer with the Time-Sharing Option (TSO) and uses the program development tools provided by that environment.
- Allows the customer to compile Net 1000 COBOL source code files in the host using the UTS COBOL preprocessor and host compiler.
- Executes the application program.
- Helps users quickly find errors using trace and debug facilities.

After an application program has been tested off-line and the compiled code has been linked, the source code can be transported from the host to Net 1000 using the Net 1000 file transfer program.

Network resources are accessed through an authorization screening process. This process compares the authorization parameters of both the calling resource and the called resource and determines on the basis of a preset screen, whether the calling resource has permission to access the called resource. Figure 9 illustrates this concept.

RESOURCE PROTECTION (continued)

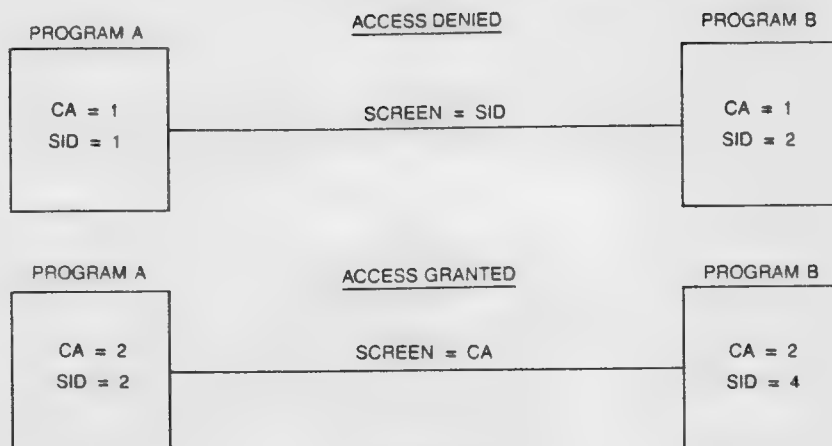


Figure 9

Customers can change the authorization screen associated with their network resources at any time.

When a file is created, it acquires the CA and SID of the

originating program. In addition, file access permissions such as READ, WRITE, DELETE, and CHANGE, are assigned to protect each file from unauthorized access.

CUSTOMER SUPPORT

The AT&T Information Systems Account Executive is the primary contact for each Net 1000 customer. This individual is supported by a team of marketing specialists and technical experts that have overall responsibility for ensuring the successful implementation and satisfactory operation of their customers' service. The AT&T Information Systems Account Executive can assist customers in determining how Net 1000 can provide the most benefit to their businesses. Members of the Account Executive's team can provide technical expertise in

data communications, information on Net 1000 customized programming, and assistance with Net 1000 application program development.

The Customer Network Management Center (CNMC) is an organization that provides operational support to Net 1000 customers. For each customer, the CNMC provides a single point of contact for his network applications. The customer can access CNMC personnel by telephone or via the network itself.

SUMMARY

Net 1000 provides a flexible data communications network service that enables users to design applications to help solve their business needs. Users can connect their terminals or host computers to access geographically distributed Net 1000 access points. They can reserve storage in the network for their programs and data. A transport facility is provided for both one-way and two-way communication between users on the network.

Each Net 1000 customer has access to a rich assortment of network software. A standard set of network application programs

are available. These application programs enable users to manage and control their network resources as well as perform functions such as file transfer. In addition, on-line and off-line program development facilities are provided. Network users can develop, link, compile and test their own customized applications using these facilities.

AT&T Information Systems has made a strong commitment toward providing a reliable flexible network service to handle the growing needs of the business community.

What's behind American Bell's long-awaited Net 1000?

American Bell is still testing its Net 1000 "intelligent network," but it will soon be publicly available. Here's what makes it tick.



In the past, solutions to data communications problems were implemented according to individual applications, starting with those having the highest potential payback. Although this satisfied near-term business objectives, it created problems later on.

Users often found themselves with a hodgepodge of data communications equipment and multiple networks that frequently were incompatible. This usually resulted in the inefficient use of such available resources as communications terminals, terminal operators, transmission paths, and host computers.

Moreover, those networks were difficult to modify to accommodate changing business requirements, such as enlarging applications or upgrading to more-advanced terminals. As the number and complexity of the networks grew, the tasks of managing the increasing investment they represented and monitoring their performance became expensive and time-consuming.

Advanced Information Systems/Net 1000 Service is a shared, distributed, customer-programmable intelligent data communications network alternative aimed at these problems.

Users connect their terminals and/or host computers to the network at geographically distributed Net 1000 service points (SPs) through any transmission path they select. Once connected, users define their own particular community of interest.

The major elements of Net 1000 are:

- Port interfaces
- Storage
- Communications processing
- Information movement.

A port interface has both a physical and a logical component. The physical component, referred to as a port, electrically connects the customer-selected trans-

mission path to Net 1000. The logical component, provided by a station call facility, allows a customer station with specific characteristics to access Net 1000. The station call facility (Fig. 1) is Net 1000's representation of user premises devices and, therefore, has a unique address called the network standard address (NSA). Net 1000 provides port interfaces to support most of today's general-purpose terminals and host computers. These interfaces provide a compatibility feature through protocol conversions that permit otherwise incompatible terminal-to-computer, terminal-to-terminal, and computer-to-computer communications.

The four classes of general-purpose terminals supported are asynchronous contention, asynchronous polled, synchronous contention, and synchronous polled, in addition to the most widely used protocols in each of these classes. Different types of terminals from each class can coexist. This permits changes without requiring major redesign.

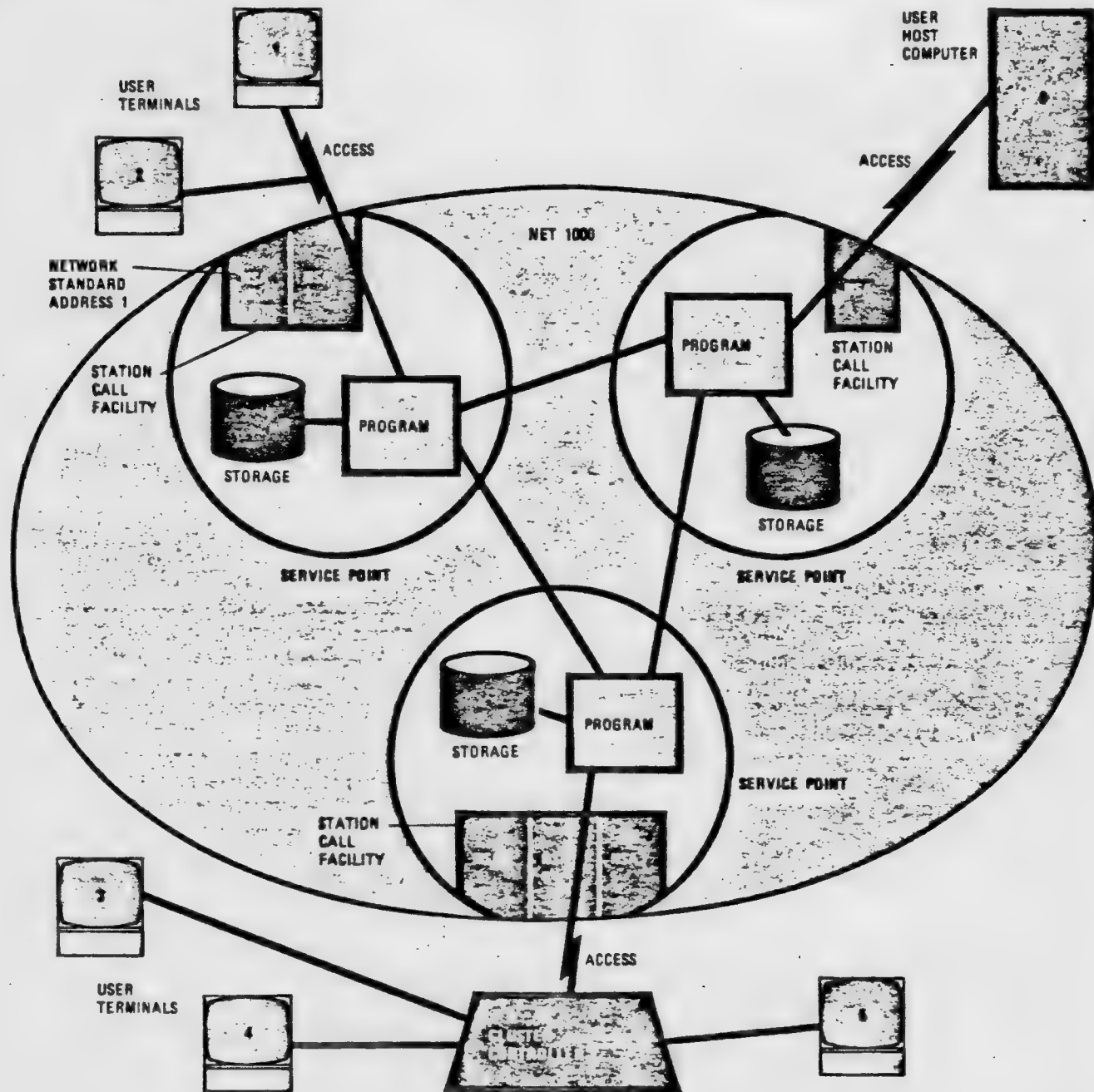
A user's host computer communicates with Net 1000 as though it were communicating directly with standalone terminals or cluster controllers. Emulation for host computer interfaces are ASCII asynchronous emulation and IBM 2780/3780 and 3270 emulation.

Storage

Storage is initially allocated on the basis of estimated customer need, but can be adjusted according to actual usage. The lead time required for changing the amount of storage reserved is one or two days, and no user hardware or software modifications are necessary. There are two customer storage categories: program storage and data storage. A user reserves program storage in kilobyte increments to store application programs (load modules) for execution on Net 1000.

1. Unique address. The station call facility, being Net 1000's representation of user premises devices, has a unique address called the network standard address

(NSA). The station call facility is what allows a user to access Net 1000. Port interfaces support most of today's terminals and host computers.



Program storage is obtained for every user at each SP where it will be used. The full amount of program storage associated with any user will always be available at the designated SP.

Data storage consists of customer files accessible to application programs via a read, write/delete, or append request. Access to files is permitted only through an authorization scheme established by the user. In addition, users can access additional data storage, as it is available, to meet unexpected peak demands, such as when actual demand is greater than reserved

data storage. At each SP, if all the reserved data storage is used, then "demand" data storage is allocated if users have selected this capability. Demand storage is billed on an hourly basis.

Communications processing

Net 1000 allows many application programs to operate concurrently and interactively. Through Net 1000, application programs can influence each other (for example, one program can cause another to execute) and control their own operation.

continued

Each application program has an NSA. An application program starts operating when a call transfer or store-and-forward transfer is directed to the application program, or when an execution request is received from another application program.

Two options are available when multiple transfers are made simultaneously to the same program. Multiple-image programs can generate a new image of the application program for execution, and the user can limit the number of images that can be generated. Or, a single-image program may handle multiple simultaneous incoming call or store-and-forward transfers. Again, the user can limit the number of simultaneous incoming requests.

There is no restriction, however, on the number of outgoing requests a program can handle at one time under either image option. Whether an application program is to execute as a multiple-image program or as a single-image program is determined by the customer.

There are two grades of processing service available: interactive and noninteractive. Interactive processing is used for application programs that require responsive execution. Noninteractive processing is considered background processing and, as such, an application program that executes noninteractively is processed when resources are available at the SP.

Net 1000 provides either call or message transmission service. Call service, which is session-oriented, allows two-way communications between end points—that is, between application programs and station call facilities.

Message service provides one-way transmission of information blocks from one storage area to another using store-and-forward or file-transfer facilities. The originator and the destination are application programs and are well suited to applications such as electronic mail, data entry, and remote batch entry. The customer selects the grade of service (priority, standard, or delayed) and the delivery option (delivery confirmation address or earliest delivery time).

Moving information

The delivery confirmation address is the address to which confirmation is sent when control of the data is passed to the destination application program. If this option is selected, a confirmation message of the same service grade as the original message is sent to the confirmation address when the data is either accepted by the destination application program or determined undeliverable. Confirmation of messages not delivered includes the reason why delivery was not possible.

If the earliest-delivery-time option is chosen, a message will not be offered to the destination application program before the time specified in the message.

In Net 1000, authorization screening protects the privacy of user information. Net 1000 software uses these screening procedures to determine if an application program or port facility should be allowed to cause another application program or port facility to execute. In addition, the screening procedures determine if an application program has the right to access a data file.

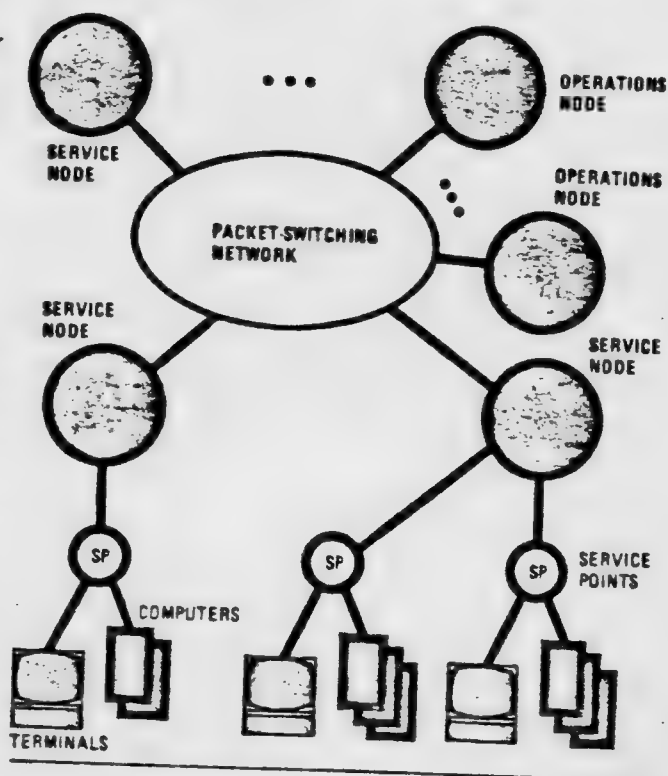
Once this is done, users may select whether their calling program or the called program will be billed for execution of the called program.

Authorization schemes

Users may establish conditions under which their applications programs and port facilities may accept an execution request. The conditions include customer account numbers and service identifiers of both calling and called programs. After the execution request screening is passed, the customer account number and the service identifier for which the called program executes are determined by a flag associated with the called program. In addition to execution authorization rights, there are authorization schemes for data file access. Customer account number and service identifier code are assigned to each file when it is created. Also, file actions of read, write/delete, and append are assigned as allowable for each application program of the customer account number or service identifier code. Then, file access rights are determined by conditions that utilize the customer account number and the service identifier code of the application program requesting action and access to the data file.

Net 1000 is a port-to-port service that provides access to customer-provided terminals and host computers. Customer terminals and their hosts are connected to ports at geographically dispersed service points via leased-line or dial access. Service points are supported by hardware/software complexes called service nodes (Fig. 2), which consist of Digital Equip-

2 Service points. Terminals and hosts are linked to ports at geographically dispersed service points via leased or dial-up lines.



ment Corporation VAX 11/780s and IBM Series/1s as front-ends. The Series/1s can be located at the node or at an SP, depending on networking costs.

Network layout

A service node can support one or more SPs. Service nodes will be interconnected via a packet-switching network using 56-kbit/s trunks and the CCITT X.25 protocol. Users will initially be able to access Net 1000 at speeds up to 9.6 kbit/s. Higher rates are expected in the future.

As shown in Figure 2, Net 1000 also uses dedicated operations nodes, which have the same basic hardware and software as the service nodes. These operations nodes, which are connected to each other and to the service nodes via the packet-switching network, provide the centralized operations of Net 1000.

For day-to-day procedures, Net 1000 provides customers with port interfaces, storage, communications processing, and information movement. In the long term, Net 1000 will provide an environment that supports upward compatibility for applications programs.

To ensure that the performance and functionality will keep pace with technology, American Bell has designed a software architecture that is layered and modular. This layered structure was designed so that, when it is economically advantageous to do so, lower layers or modules of lower layers can be replaced with new hardware and/or software implementations without affecting the remaining layers.

Building blocks

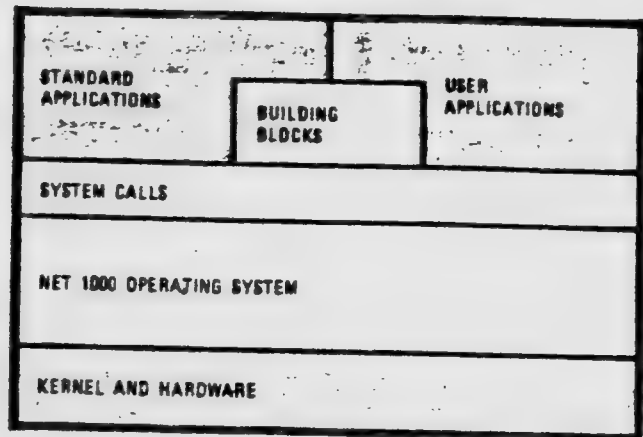
At the highest level, the Net 1000 software architecture consists of three layers: the application layer, the Net 1000 operating system, and the kernel and hardware layer (Fig. 3). Customer programs execute in the application layer. These programs can be provided by either American Bell or the user. Building blocks, or application utilities, are included in Net 1000 as part of the user environment. Some examples of building blocks include menu drivers, forms facilities, editors, and a command phraser. These utilities can be called by Cobol application programs as subroutines.

The Net 1000 operating system layer provides the application layer with such services as communications facilities and file management. These services are provided through libraries of system calls structured as Cobol subroutines. This structure will remain stable throughout Net 1000's life.

In addition to providing basic services, the operating system layer is responsible for Net 1000 security. To achieve this, the operating system layer performs appropriate authorization checks each time a system call is invoked.

The kernel provides a uniprocessor operating environment in terms of memory management, device management, machine check code, and scheduling. The operating system provides all multiprocessor mechanisms, which help minimize dependency on the kernel. To further minimize this dependency and to provide efficient service, a Net 1000 supervisory layer has been interposed at the interface to the kernel, as

3. Layered software. Net 1000 software architecture consists of three layers: the application layer, the operating system, and the kernel and hardware segment.



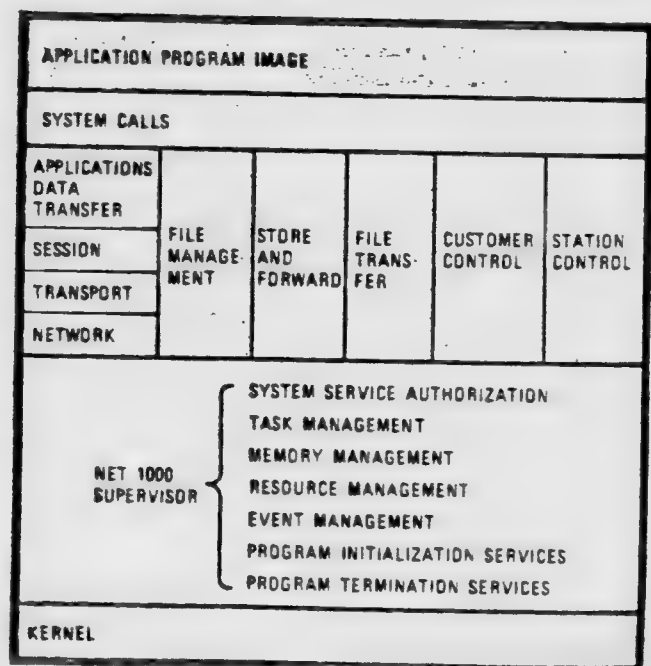
illustrated in Figure 4.

Within the supervisory layer, a collection of subroutines provides an execution environment for processes at the operating-system and application layers. Subroutines provide system service authorization, task management, memory management, resource management, event management, program initialization services, and program termination services.

Interposed layer

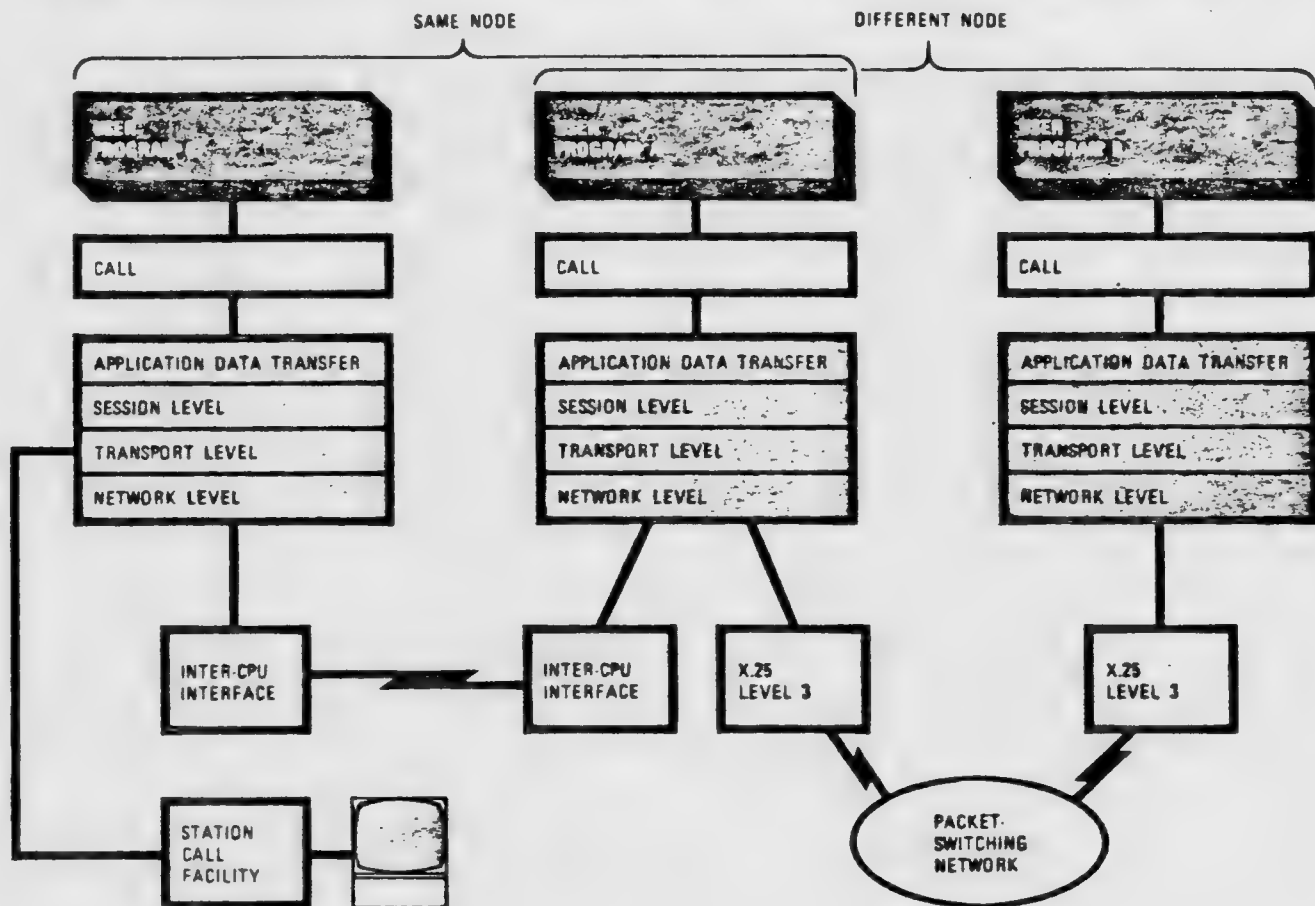
A further illustration of Net 1000's software architecture layering is the interprogram communications (call)

4. Supervisor. Net 1000 software also includes a supervisory layer, which is located at the interface to the kernel. This section helps streamline service operations.



5. Call facilities. The interprogram communications (call) facilities are implemented at the session level of the open systems interconnection (OSI) reference

model. Net 1000 has separate subroutine libraries for the session, transport, and network levels of OSI. The station call facility performs protocol conversion.



facilities (Fig. 5). The call facilities are implemented at the session level 5 of the International Organization for Standardization's open systems interconnection reference model. The multilevels of this model are followed in Net 1000 via layering of subroutine libraries, with separate libraries for the session, transport, and network levels.

Furthermore, a layer called application data transfer (ADT) is interposed between application programs and the session-level library. The ADT layer performs necessary authorization checks and provides the interface between the Cobol language application environment and the C language environment of the operating system.

Net 1000 call facilities support interprogram communications between programs in the same SP, programs in different SPs in the same service node, and programs in different service nodes. Call facilities also support communications between devices and between programs and devices through the station call facility.

The station call facility acts as a software surrogate for the customer's device. It acts as the end point in an interprogram communications session. In addition, the station call facility performs the necessary protocol

conversions to allow incompatible devices to communicate with each other (Fig. 5).

What is ahead?

Net 1000 is being introduced with phased availability of announced features. Testing and pilot operations will take place at several Net 1000 service locations through the third quarter of 1983. Seventeen service points are currently being established in New York City, Los Angeles, San Francisco, Washington, D.C., Atlanta, Philadelphia, Boston, Pittsburgh, Greensboro, Houston, Denver, St. Louis, Cleveland, Seattle, Detroit, and Dallas.

Additional features and SPs are expected to be announced in the future to meet market demand. [See DATA COMMUNICATIONS, July 1982, p. 40 for Net 1000 pricing.] Current projections are that 100 SPs might be needed by the end of 1984. ■

MIS Week

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AT&T Says Net 1000 Is Flying Now

By ROBERT FELDMAN

SOMERSET, N.J. — Things are starting to hum for "Net 1000," AT&T's value-added carrier, with some two dozen large customers on-line and customizing the network for their applications.

The unique network had some trouble getting off the ground after a premature announcement (as "Advanced Communications Service") five years ago. But it is now on target, according to Allen Rebert, director of enhanced network services applications.

In the last year, he said, AT&T engineers and marketers have been working with early users to define specific business problems, develop solutions, and test and evolve the service. The industries include financial services, transportation, distribution and data exchange.

"We have agreed not to disclose the identities of our customers until they are ready," said Rebert. "Knowledge of their planned use of Net 1000 could jeopardize their competitive edge."

The director pointed out, however, that an executive at the Ford Motor Co. recently revealed that the company was working with Net 1000 personnel to set up a Ford dealer distributor network for parts location. In addition, Transamerica Corp. is also beta-testing.

"The tests we have conducted over the past year have been very beneficial," Rebert told MIS Week. "At the present time, we are interested in working with customers who have a volume communications processing requirement that can be met effectively with Net 1000 service. We are ready to supply substantial support resources."

24 Big Users On-Line For Net 1000

Rebert gave his pitch recently to some 300 representatives of potential users from Fortune 500 companies at a special, three-day seminar in San Diego, Calif., put on by International Data Corporation, Framingham, Mass.

In his briefing, Rebert described the technology of the offering, a communications-oriented, enhanced network service that combines distributed control, processing and storage to meet the needs of users.

He told the executives: "We believe there are several large industry-oriented opportunities for using Net 1000 to achieve business benefits... (and) we plan to actively support entrepreneurs who wish to take advantage of them."

Criticism Answered

Some earlier criticism of Net 1000, made last December after an in-depth seminar in New York sponsored by Technology Transfer Institute of Santa Monica, Calif., was answered by Rebert in an interview with MIS Week.

To the observation that Net 1000 was not as ubiquitous as such packet-switched nets as GTE Telenet and Tymnet, Rebert said that there were 17 service points now operating — in Los Angeles, San Francisco, Denver, Washington, Atlanta, Chicago, Boston, Detroit, St. Louis, Greensboro, N.C., New York City, Cleveland, Philadelphia, Pittsburgh, Dallas, Houston and Seattle.

"Any customer not in one of these places, who wants to get on the network, will be accommodated by us with an access point on the local loop," said Rebert. He said he expected to have about 100 service points in operation by the middle of next year.

system calls for communications functions are not in Cobol, but in C language.

One user at the San Diego seminar who heard Rebert's presentation repeated an earlier criticism of Net 1000. "The service certainly appears very promising, but there are many questions about what it will cost," the attendee — from a large aerospace company — told MIS Week. He asked not to be identified.

"We're taking a long, hard look at it," he added. But he said his company was currently running a pilot program with the rival Information Network of IBM, as well as General Electric Information Services Co. (Geisco) for international traffic.

Rebert's demeanor seemed cautiously optimistic about the future of the AT&T venture. "We're trying to nail down industries that have a need for protocol conversion, distributed storage and the other features we're offering," he said. "If we don't do our thing in a reasonable

time and if we're still sitting here six months from now, we'll have something to answer for."

Most data on other networks moves at speeds of 9.6 kilobits per second (Kbps) or slower, but Net 1000 plans to get a jump on the competition by offering speeds to 56 Kbps sometime next year.

To the criticism that Cobol, the language of Net 1000, was not cost-effective for communications, Rebert replied that "the business community we're selling to is a Cobol community." He pointed out, however, that

Rebert will speak on "Integrating Outside-Inside Databases" before a meeting of the Information Industry Association in San Francisco on Dec. 12. Papers on Net 1000 will also be contributed at Telecon '83 in Geneva later this month and at Globecom '83 in San Diego on Nov. 29. The papers deal with applications such as travel, file transfer, protocol translation and download functions.

VAN Vendors Ogle Truckers

By ROBERT FELDMAN

WASHINGTON — Value-added network (VAN) vendors made their respective pitches at the forum and exhibition of the Transportation Data Coordinating Committee (TDCC) held here, hoping to cash in on an allegedly about-to-boom market for heavy inter-company data communication in the transportation industry.

On hand were marketing troops from AT&T Information Systems (ATT-IS), purveying its new Net 1000; Tymshare Inc., with its EDI-Net (see Dec. 21 MIS Week, page 15); plus quieter salesmen from IBM's start-up Information Network (IBM-IN) and General Electric Information Services Co. (Geisco).

All were beating the drums for the benefit of 750 delegates from the big trucking, railroad and warehouse companies. One reason for the interest by the truckers in more efficient electronic data interchange (EDI) is turmoil in the newly deregulated industry as a result of price-cutting. This is being carried out by now, and largely non-union, rivals mostly hauling full truckloads.

The embattled establishment, on the other hand, is going with its strength — transportation of less-than-full truckloads (LTL), using their nationwide chains of terminals to assemble the pieces into full loads.

The complex billing, tracing and detail operations of LTLs require ready access to databases and computer-communications functions. LTL business lends itself admirably to EDI.

Major Review Boost

For example, by installing a sophisticated computer and communications system, Yellow Freight System, Shawnee Mission, Kan., increased its revenues from \$776.4 million in 1980 to

about \$1.05 billion last year and its chain of terminals from 248 to 440.

Net 1000, though officially on the market for more than a year, inexplicably remained under wraps until the TDCC show, where it received its first public demonstration. Some two dozen users are currently trying Net 1000, according to the company. Anne B. Sziget, AT&T-IS district manager for enhanced network services, said that, in addition, "We have a number of other customers."

One such user, for more than a year, is Roadway Express of Akron, Ohio. Roadway's MIS manager, George W. Calhoun, and programming supervisor, Helene Cavany, have been debugging the system with the help of Helmut Klemm, their AT&T-IS customer service representative.

Calhoun told MIS Week that Roadway had used a leased AT&T multipoint private line since 1968, to connect its 510 locations nationwide. Now, on Net 1000, it has placed some 300 of its more than 200,000 customers on dial-up access. None of the dial-up customers has a true mainframe and all possess simple dumb terminals.

"We Won't Switch"

"We're now putting freight bill invoices on magnetic tape, so these clients will need bigger computers soon," said Calhoun, adding that he expects the TDCC industry group to come up with the proper software to handle the work. EDI assumes an interface between intelligent CPUs.

"We didn't look too hard at the other value-added networks before signing up with AT&T," the manager recalled. "Tymshare has been around longer, and its Tymnet offers most of the same things Net 1000 does, but we feel more confident with AT&T. As long as features are equal, we

won't switch from AT&T."

The company considered RCA Cylrix too, but decided the satellite VAN doesn't have the small local coverage required by a leading trucker. "For some other companies, Cylrix could be the economical alternative," Calhoun allowed.

An advantage of Net 1000, Cavany said, was that the network loads data for individual customers in remote nodes, thus permitting Roadway's mainframe to shut down instead of staying switched on 24 hours a day. Roadway uses the Net 1000 node in nearby Cleveland, via a link from Ohio Bell.

The principal applications of the Net for Roadway are two: downloading its manifests in block mode to Net 1000, and trace operations via System 85's electronic document communications (i.e., electronic mail) software. The new AT&T switch has been ordered, but is still some distance away.

Roadway's mainframe is a Univac, but the company expects to switch to an IBM 4300, then go eventually to a 3083.

Szigeti, one of the many marketers AT&T-IS has fielded, conducted a workshop on Net 1000 during the two-day TDCC forum. She made several sales points for the product, including its "low start-up cost and nationwide applications" and "synergy with premises systems" — an allusion to the Dimension product line.

Design New Applications

She told MIS Week that, in addition to Roadway, other customers were designing new applications for the Net. "We have a lot of different types of contracts with our users — trial, pilot and application," she said. She declined to identify any of the users — MIS Week discovered Roadway at a luncheon table occupied by five AT&T salesmen



MIS Week photo by Robert Feldman

John Rusinko, of AT&T's marketing group, puts the demonstration model of the company's Net 1000 through its paces at the TDCC show in Washington. The two knowing watchers are already users of the Net — George Calhoun and Helene Cavany, of Roadway Express, Akron, Ohio.

and three users.

But she boasted that Net 1000 could already outdistance Tymshare and other VANs. "Mr. Calhoun has not yet seen the full power of Net 1000," she averred. "Shortly, you'll see the effect of our layered architecture, with users building on their applications to a second, third or any number of other locations, both intra- and inter-company, and all under the end-users' control."

"We can put a file out there even in Gila Bend, Ariz.," she said, referring to Roadway's most remote terminal. She pooh-poohed the large number of access cities the other VANs habitually boast about (e.g. Tymshare's 1,000 nodes), saying that "an access point is all the user wants or needs, he doesn't know from nodes. If providing this access costs us bucks, that's our problem."

Tymshare Pushes EDI-Net

Szigeti represents Net 1000 on the ANSI X.12 committee seeking to expand data standards and establish a common data dictionary.

Tymshare, too, hopes to capture some of the expected business boom with its EDI-Net, which integrates the firm's packet-switching network with specific EDI services that it has developed for the rail, trucking and grocery industries.

According to George Klima, director of accounting systems for Super Valu stores the new EDI-Net offering may be valuable for new Tymshare customers because it will offer them the benefit of services that Tymshare and its early customers, such as Super Valu, had to develop from scratch.

For instance, Klima said, Super Valu currently does its own converting of messages from the UCA (Uniform Communication Standard) formats to the formats used by Super Valu's accounting systems. For more recent customers, Tymshare has offered the translation from UCS to company formats, as part of its service. "I'm not sure there is much else that is new," he added.

Tymshare would not give specific figures on the price of the service but says that prices will go down as volume increases.



Net 1000 Offers Flexibility In Solving Business Problems

By ALLEN REMERT,
Director, Net 1000 Product Support,
AT&T Information Systems

MORRISTOWN, N.J. — Net 1000 is a shared, distributed, customer-programmable, intelligent data communications network that gives customers the flexibility to customize solutions to their business problems. It features an open-ended, communications-oriented architecture that is compatible with most terminals. It offers usage-based billing and end-point compatibility.

The data communications network service is designed to help customers solve a broad variety of business problems. It accomplishes this by providing a range of information and data management services to its customers.

In addition, Net 1000 currently offers customers access to a set of software programs to manage and control their network operations.

Net 1000 also provides its customers with an application program development facility where users can design, develop, test, install and operate their application programs in a manner that enables them to efficiently use and display information.

Advantages Seen Numerous

Customers also have access to a rich assortment of network software, which can be written by AT&T, by the customer or by third-party software vendors.

Net 1000 advantages over other networks in use today are: It is a distributed, shared network that can be accessed from any place in the United States; it offers a range of support services that provide customers with flexibility in developing and using their applications; it can be used with a variety of interfaces; it allows users to decouple their applications from a host or data center; it provides effective inter-organization and intercorporate communications; and it allows its customers to expand applications in a distributed manner with a minimum of effort.

For currently deployed service points, maximum transfer speed for data is 9.6 kilobits per second (Kbps). Users can access Net 1000 by dial-up, leased or dedicated line between their premises and Net 1000 access ports. These access lines can be acquired from any common carrier.

Net 1000 supports three classes of general purpose terminals: asynchronous contention, synchronous contention and synchronous polled.

A user's host computer communicates with Net 1000 as though it were communicating directly with a terminal or channel controller. Net 1000 currently provides ASCII asynchronous emulation and synchronous contention (IBM 3780) and asynchronous polled (IBM 3270) emulation for host computers. Additional protocols will be added to meet customer application requirements.

A station facility is a program in the network that acts as a surrogate for terminals or computers connected to the network. From a station facility, users can access application programs residing within the network or other station facilities.

Program Data Storage Available

Net 1000 allows customers to store both programs and data. In addition to the data storage reserved by contract, users may elect to have "demand storage" available in case they experience "peak demand" periods that exceed their allocated storage.

Net 1000 provides both a call service and a message service for transporting data between station facilities and programs within or between service points.

Net 1000 allows many application pro-

grams to operate concurrently and interactively. Applications can be implemented with a minimal capital investment and no long-term commitment on the part of the customer. Because usage determines cost, there is never a problem of under-utilization. And with AT&T-IS providing network management, scarce and costly customer resources need not be tied up.

AT&T Paves Database Way

MORRISTOWN, N.J. — AT&T Information Systems will announce this week its first third-party agreements for software for Net 1000 — with Dow Jones Information Services and AGS Computers Inc.

The systems to be programmed by AGS will allow customized access to the Dow service via Net 1000.

Sources at AGS confirmed that their people had been studying the Net 1000 technology for about a year and are currently writing software applications programs for the service.

The announcement is authoritatively reported to be the first in a series of third-party agreements with software and computer service vendors to provide customized software for Net 1000 users.

— Robert Feldman

Authorization screens allow access only to relevant files and programs, insuring the integrity of company data.

AT&T-IS is using Net 1000 for its own corporate data management, but has agreed not to disclose its customers or their applications until they are ready to do so, since knowledge of their planned use of Net 1000 service could jeopardize their competitive edge.

However, Business Week (Sept. 5) reported that the Ford company was working with Net 1000 to establish a Ford dealer network application. Also, a recent article in MIS Week (Jan. 4) discussed a Roadway Express application. AT&T-IS is currently working with several dozen customers in such industries as distribution, transportation, financial services, and insurance.

By mid-year, there will be more than 100 access points across the country. Net 1000 applications are being marketed by AT&T-IS.

Implementing "Partnering" Strategy

Opportunities for other firms to apply Net 1000 in their business relationships with customers arise. Several examples of this "partnering" strategy are being implemented in cooperation with several third-party software vendors.

AT&T said it was difficult to provide a typical price because the service is so customizable and tailored to suit each customer's needs. The pricing elements depend on access ports, transport, storage and processing. Most applications costs are dominated by access and processing charges. Trade-offs among these elements, as well as between fixed or monthly costs and usage-based costs, are done with customers by AT&T-IS account teams, using pricing tools developed for this purpose.

As Net 1000's deployment is expanded this year, additional protocols and software tools will be added as part of the implementation of customer applications. Increasing use of partners to provide complementary technical, business and industry skills will be vital to the market thrust.



News Release

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AGS COMPUTERS, INC. WILL PRODUCE CUSTOMIZED SOFTWARE FOR DOW
JONES NEWS/RETRIEVAL TO USE ON AT&T INFORMATION SYSTEM NET 1000

AGS Computers, Inc. and Dow Jones Information Services have announced the signing of an agreement whereby AGS will provide a customized software program for users to electronically sign up for Dow Jones News/Retrieval via AT&T Information Systems' Net 1000.

"AGS has worked closely with us during the past year to learn the capabilities of Net 1000, to train its people and to pursue third-party opportunities like the Dow Jones program," said Allen Rehert, Net 1000 Director of Product Support. "We see this as an example of an approach in partnering to solve business problems. It's the first example of our strategy that we discussed a year ago to use third-party vendors to write Net 1000 application programs for companies."

"We believe Net 1000 will be a significant factor in the marketplace," said Dennis Nitka, Director, Systems Development for AGS. "The investment we have made so far reflects our confidence in the service and our commitment to aggressively pursue the business opportunities that Net 1000 will generate."

AGS Computers, Inc., a leading national company in the computer software/service industry, is headquartered in Mountainside, New Jersey. The company provides software development services and builds and markets software products.

- more -



Dow Jones News/Retrieval provides 120,000 users with business and economic, securities quotes, financial and investment services, and general news and information through its 27 databases.

AT&T Information Systems is the AT&T subsidiary that designs, develops, markets and services a wide range of information movement and management products and services. Net 1000 is the shared network service component of AT&T-IS product family. It provides a communications-oriented, enhanced network service that combines a distributed control, processing, storage and transport of information to meet the evolving needs of today's business customers.

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AT&T Information Systems

NET 1000 ELECTRONIC DATA INTERCHANGE (EDI) APPLICATIONS

Close Communication Among Shippers, Customers And Carriers

When the movement of goods is crucial, effective information management is the gateway to profitability. That's why companies with sophisticated internal systems are turning to external applications involving the interchange of data with suppliers, customers and freight carriers.

For suppliers and their customers, a low-cost, full-time data interchange capability means better all-around control and productivity: a shorter purchase order cycle with fewer errors; more productive expeditors, order clerks and sales people; more control of inventory levels; and improved cash flow. For freight carriers, it permits a high level of service that can differentiate them from their competitors.

Net 1000: The Intelligent Network Solution

NET 1000 offers a highly productive and flexible solution to the requirements for electronic data interchange.

Distributive. Offering nationwide access and eliminating problems of equipment incompatibility, NET 1000 is ideally suited to a multi-user, multi-location distributive environment.

Low-cost. Applications can be implemented with a minimal capital investment and no long-term commitment. Because usage determines cost, there's never a problem of underutilization. And with AT&T providing network management, scarce and costly resources need not be tied up.

Customizable. In addition to data transport, NET 1000 offers processing power and data storage as required. Existing NET 1000 software for such applications as shipping status and manifest file inquiry can be used as is or be customized.

Security/Privacy. Authorization screens allow access only to relevant files and programs, insuring the integrity of company data.

Typical Carrier Application

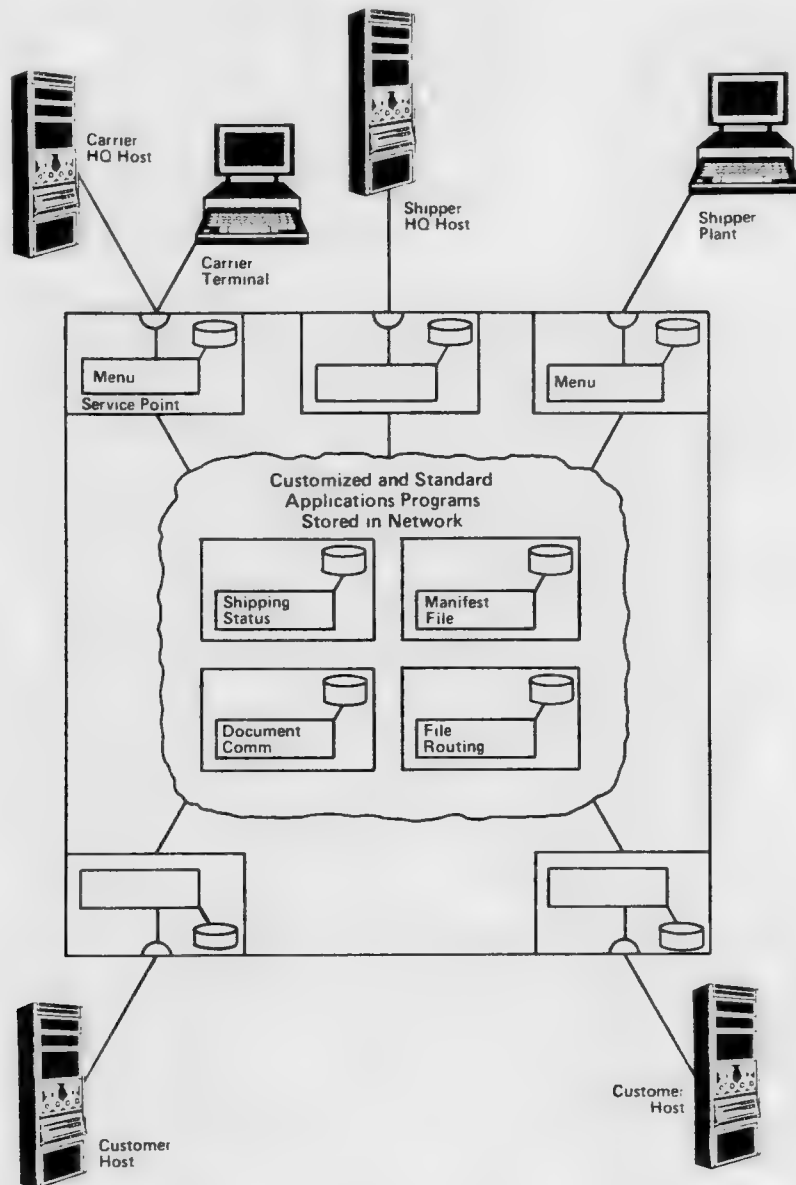
A freight carrier will typically use NET 1000 to communicate between headquarters and freight terminals and to give customers easy access to shipping status and manifest information.

Initially, the carrier sets up files in NET 1000 for shipping status and manifest information. The files are updated as required, usually daily. Data from freight terminals can be sent to headquarters for processing before being entered or can be sent directly to NET 1000 and processed there reducing the load on the carrier's host computer.

Each customer is given a separate ID, which permits access to relevant files and programs only. For example, a customer accessing manifest information will select the manifest program from the NET 1000 menu and enter the user ID and valid PRO number to call up the needed data. In similar manner, the shipper may also be given access to its shipment status information.

Once the stored information is provided, the customer can query the carrier's host through NET 1000 for additional information, such as the current day's status changes. Thus, a carrier can design an information application with optimal data storage: in its host computer; locally at the Service Points; and in central network storage.

Additionally, NET 1000 Electronic Document Communications can be used internally to broadcast announcements and eliminate telephone tag when fast responses to inquiries are required. This is a powerful electronic mail function that is fully compatible with the same function on AT&T's System 85.



TRANSPARENT ACCESS TO APPLICATIONS PROGRAMS.

Application software may be distributed throughout the network. From any Service Point, a user may access any authorized program or data file.

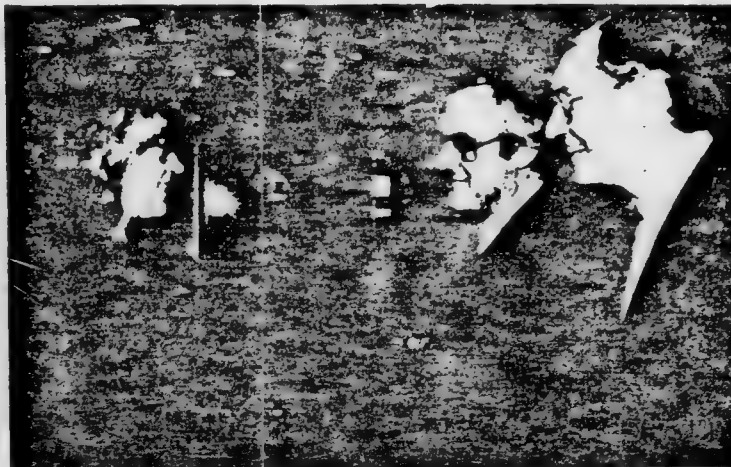
Typical Shipper Application

A manufacturer or distributor will typically use NET 1000 to deal with a variety of transportation-related issues, such as scheduling workloads based on arriving shipments, sending purchase orders to suppliers, keeping customers informed of shipments and maintaining close contact between headquarters and remote plants and warehouses.

Shipping information from suppliers is accessed through NET 1000 via files set up either by the freight carrier or the supplier as an element of customer service.

After approving purchase orders generated by an inventory application, a Purchasing Manager will access NET 1000's File Routing Package. This sends the purchase order electronically from the company's host computer to the supplier's host, with automatic confirmation of its receipt. If the supplier's and shipper's banks were tied into the system, the supplier could be paid automatically once the receipt of the goods was acknowledged.

Messages can be sent via NET 1000 both internally and externally to anyone with a network address.



AT&T-IS last week picked up AGS Computers Inc. as a vendor of third-party software to reside in Net 1000. After the announcement, Net 1000 chief Allen Rehert, center, took AGS systems director Dennis Nitka down to the Net 1000 display at CommNet in Washington. Demonstrating the network, left, is Virginia Farah, an ATT-IS manager.

Net 1000 Custom Deal OKd

By ROBERT FELDMAN

WASHINGTON—Third-party, customized software for Net 1000, AT&T Information System's embryonic value-added network (VAN), is off and running.

AT&T-IS and AGS Computers Inc., a leading software firm in Mountainside, N.J., closed a deal last week that ought to save their mutual customer, Dow Jones Information Service, a bundle by automating DJ's process for signing up new subscribers.

The custom software will allow users on Net 1000 to electronically sign up for the business news retrieval service, using any dumb or smart asynchronous or synchronous terminal on ASCII mode, on dial-up or direct access, at speeds from 300 baud up.

The word is that DJ is gearing up for a third-quarter start on marketing the novel sign-up system, because the Wall Street firm would be saving costs by automating its data-entry-like process for new subscribers.

DJ already has 120,000 subscribers, served through 27 databases nationwide, for the service that interactively gives news and information, market quotations and financial and investment services.

Last week's announcement was of the deal between AGS and DJ, but Net 1000 is designated as the value-added carrier that will receive the software package from the user's host and then store it in the network VAX machines. Net 1000 will transmit the entered data to the customer's host.

The AGS-Net 1000 arrangement looks beyond the DJ contract, of course, into other applications. For more than a year, AGS people have been learning about AT&T's new net—the slowly-growing, competitive enterprise that, advertised years ago as "Advanced Communication Service," provided the

initial impetus for AT&T to break free of the regulated arena.

Allen Rehert, AT&T's director of enhanced network services applications (Net 1000), said in a statement about last week's deal that it was "the first example of our strategy.... to use third-party vendors to write new Net 1000 applications programs for companies."

Dennis Nitka, the AGS director of systems development, said Net 1000 would be "a significant factor in the marketplace" and that his company had made "a commitment to aggressively pursue the opportunities" that the net presented.

Net 1000 is defined as a shared network providing a communications-oriented, enhanced network service, combining distributed control, processing and storage and transport of business information.

MIS Week spoke to Nitka and Rehert near the Net 1000 exhibit at the Communication Networks show held here last week.

Nitka said that the DJ service now uses an 800 number for signing up new subscribers. "They have to go to a PC or terminal, dial the access number, get the form and answer the questions," he explained. "Net 1000 will now feed this, and DJ doesn't have to change its host software."

Rehert said the three-way deal involving AGS, DJ and AT&T, signaled his company's exit from the loop of directly providing software for customers. From now on and including the present AGS-DJ deal, the pattern will be for Net 1000 to introduce third-party software providers to customers needing programs, and then get out of the picture. For AT&T, AGS previously provided the programs for an internal electronic mail system.

Rehert added, however, that the Net 1000 sales force, which is now national, is out identifying industry applications for third-party selling.

"In some cases, we'll subcontract, and in others, get out of the loop," he said.

5/23/84

5/25/84

'Celestial' Solution On Net 1000 For Mortgage Firm Problems

By IRWIN GREENSTEIN

MINNEAPOLIS, Minn. — Norwest Mortgage Inc. seems to have found a "Cloud Nine" solution to some of its operations problems, and claims that it is saving an estimated \$16,000 per month by going on line with a Net 1000 node from AT&T Information Systems.

The "cloud-like" architecture of Net 1000 has enabled Norwest to participate in development of customized software for its Net 1000 system called Nornet. The two Nornet applications that have been on-line since November 1983 — "Priceline" and "Truth in Lending" — have cut telephone bills and manpower costs, in addition to providing further information on the company's customer base.

"Putting our Priceline on Net 1000 is less expensive than the 800 number we used previously," said Michael B. Kern, assistant vice president of communications services at Norwest. "With an 800 number, you can't know who calls you, but since we've transferred Priceline to Net 1000 we do know. It's given us a marketing advantage."

Current Rates Listed

Priceline lists current mortgage lending rates. Before Nornet, Priceline was offered to Norwest users on a telephone recording.

"It was about 6.5-minute call that cost us about \$2.25. On Net 1000, we're billed \$1.75 per user," Kern said.

John Lochman, district manager for financial services with AT&T-IS, has been involved with Nornet since its inception, elaborated on other advantages of disseminating Priceline over Net 1000 compared to the 800-number recorded message.

"With the voice system, their users would call up and listen to the tape of the current mortgage rates and scribble down the information," Lochman said. "Then they would call back to confirm the information. If they wanted a particular rate that was in the middle of the message, they still had to listen through the tape to get it. With Net 1000, they can access the system by dialing a local phone number. They can either scan through the rates or get a hard copy of them."

Susan Murtishaw, who contributed to development of Nornet software as a member of technical staff at AT&T-IS, also cited a time-saving element of Nornet's Priceline.

Time-Saving Feature

"When Norwest wanted to change one rate on the voice Priceline, they had to rerecord the message. Now they can go into the edit mode and change the rate they want on their terminal," she explained.

Kern noted that Priceline was updated daily at noon, when the flurry of calls began. The hardcopy of Priceline proved cost-effective in reducing the number of calls to the toll-free version.

"We would have about 15 people in an office calling Priceline, but with the hardcopy, one person retrieves the information, copies it and distributes it to other people in the office," Kern said. Norwest is still using voice Priceline; since most users of the service are accustomed to the voice version. He estimated that the toll-free Priceline was receiving about 30,000 calls per month.

"About 70 percent of the people still want to use voice Priceline. Our goal is to reduce that number to 50 percent by the end of 1985," Kern said.

New Software In Works

He must be optimistic on the results, since Norwest has AT&T-IS developing software for new applications scheduled to come into service later this year, in addition to having the hardware already in place for it.

AT&T-IS contends that customized software for Net 1000 is a key feature that differentiates the system from a value added network (VAN).

"No VAN will allow the user to write their own software to customize the network to meet their needs," touted Lochow.

Some other users preferred the customized software concept over a VAN.

The "Dow Jones News/Retrieval Services," deployed in January, electronically enlists subscribers to any Dow Jones data base, as well as making available the data bases to other Net 1000 corporate users.

Ford Motor Company has been testing Net 1000 since the fall of 1983 with a portion of its dealer population to locate and order parts.

Roadway Express Co. sends cargo lists of its fleet of trucks to 500 nationwide locations over Net 1000, and also uses the network to track shipments. The Roadway network has been in operation since December 1983.

Nornet Pioneers

Nornet, deployed in November 1983, also required pioneer software development, because like each of the respective users it was a first for its industry on Net 1000.

AT&T-IS contends that software for new applications can be adapted to similar business.

While Kern declined to disclose the cost of Nornet, Lochow said the cost of a network can be determined after the user's needs have been determined. Each system is individually priced according to the customized service.

A customer's software application resides in Net 1000, which is an X.25 packet-switching network. The software is developed by the Net 1000 customer, a third party or AT&T-IS. The programs are then stored in as many service points as the customer needs. Storage is allocated on a contract basis and is

later adjusted to frequency of use.

Usage-Based Costs

"Just about all costs are based on usage," Lochow said. "If you don't use a feature, there's no charge. There are some fixed charges. Log-on I.D. numbers and each network address cost \$1.00 per month."

He added that asynchronous connect time currently costs 7 cents per minute.

The "cloud-like" architecture refers to the nationwide distribution of various nodes. Service nodes house computers and other equipment needed to handle interfacing and protocol conversion. Operations nodes are for management of the network. Customization nodes are used to create and test user application programs.

Access into the network, however, is gained through service points. These service points are interconnected by X.25 packet switching networks, thus acting as gateways into the customer's stored information. Users gain access to Net 1000 through dial-up local lines which are leased or dedicated. Access lines can be acquired from any common carrier. Further, it can be accessed from anywhere in the U.S. Net 1000 also features electronic mail.

"The network will accept any asynchronous terminal or 327X bisynchronous terminal, such as the AT&T 4540, or IBM 3278, 3780 or 3275," Lochow explained. "Net 1000 will autospeed detect and autoparity detect," he added.

Universal Compatibility

Compatibility with virtually any data terminal and computer has become a marketing advantage for Norwest.

"The approach to the network is communication between like and unlike terminals," Kern said. "It makes transparent the communication process. When someone dials up Priceline or our Truth in Lending application, they think they are communicating directly with Norwest."

In actuality, although users call a local number, they are communicating with the nearest AT&T-IS service point in which Priceline resides.

Kern has found that with Net 1000, compliance with corporate and Federal guidelines in computing rates for loan applications has become "fail-safe."

Norwest is bringing another program out of the beta test and onto the system. Murtishaw described it as a loan prequalification program.

"The prequalification service has eliminated a lot of paper work, and we've gotten good feedback on it," Kern said.

According to Murtishaw and Kern, other loan-related services will be available in the third quarter of this year.

"We think Net 1000 allows our remote locations to do things quicker and more accurately than before," Kern noted.

AT&T Information Systems

■ AT&T's net 1000 is a combination of the traditional value-added packet-

switched network and an on-line applications-oriented processing service. It is designed to provide compatibility between many different terminals and computers, and to integrate diverse networks, providing access to multiple business applications and data bases from a single terminal. Besides transporting data, it also provides communications processing and storage capabilities, as well as management of data networks.

Net 1000 users connect their terminals and hosts to service points located in major United States cities. At the start of 1984, service was available in 17 cities, with plans to expand to 200 cities by year's end. These service points house the computers needed to handle the processing, interfacing and conversion chores, and provide storage for applications software and data.

Users are encouraged to plan and develop network applications and leave their programs in the network for execution on demand. For application software, users employ a subset of the Ansi Cobol programming language. There's also a forms-definition facility which lets users define terminal form and screen displays and establish edit-validation criteria. Authorized use of Net 1000 files and programs is protected by system software.

Net 1000 provides compatibility between different terminals and hosts by performing the necessary code conversion, protocol translation and speed matching. Net 1000 supports three classes of general-purpose terminals: asynchronous contention, synchronous contention and synchronous polled. A user's host computer communicates with Net 1000 as though it were communicating directly with a terminal or cluster controller. Currently, Net 1000 provides Ascii asynchronous emulation and synchronous contention (IBM 3780) and synchronous polled (IBM 3270) emulation for host computers. From a station, users can access programs residing within the network or other stations.

Net 1000 provides two basic types of information movement: Call and Message. Two-way, session-oriented Call service is intended for interactive inquiry-response applications; Message service provides one-way transmission of blocks of information using Net 1000's store-and-forward capability. Messages can be edited and stored in the network for one-to-one or one-to-many communications, and delivery can be scheduled or on demand.

Net 1000 offers a set of standard application programs that a user can employ either as stand-alone programs, or in conjunction with other programs. For instance, an IBM 3270 format translation program allows users to interface inexpensive asynchronous terminals with host computers that normally work with IBM 3270-type terminals. It also allows users to dynamically switch between such terminals on the same host or on different hosts, regardless of location, by using a menu-driven authorization interface which is under control of an administrator in the user's organization. Also, a host-network file distribution program allows users to download information from a host

In January, AT&T-IS signaled its intention to encourage third-party software suppliers to develop custom packages for Net 1000. The occasion was the announcement of an agreement between AGS Computers of Mountainside, New Jersey and Dow Jones Information Services whereby AGS will provide a customized software program for users to electronically sign up for the Dow Jones news/retrieval service via Net 1000. "AGS has worked closely with us during the past year to learn the capabilities of Net 1000, to train its people and to pursue third-party opportunities like the Dow Jones program," says Allen Rehert, Net 1000 director of product support. "It's the first example of our strategy . . . to use third-party vendors to write Net 1000 application programs for companies."



News Release

For further information contact

JoAnne Kennedy
Dow Jones News/Retrieval
(609) 452-2000

Dick Gundlach
AT&T Information Systems
(201) 898-8342

100 Southgate Parkway
Morristown, New Jersey 07960

DOW JONES NEWS/RETRIEVAL SERVICE AVAILABLE
THROUGH AT&T INFORMATION SYSTEMS NET 1000 SERVICE

Dow Jones & Co., Inc. announced today that Dow Jones News/Retrieval, the leading provider of electronically delivered business and financial information, will be available to corporate users via AT&T Information Systems' Net 1000.

This means that prospective users of either service can now make more efficient use of Dow Jones on-line database through AT&T Information Systems intelligent network, Net 1000. "We are delighted to be working with AT&T Information Systems in bringing Dow Jones News/Retrieval to the corporate subscriber," said Carl M. Valenti, vice president of Dow Jones Information Services.

"Users having terminals with the VM operating system, which tells a computer how to handle instructions, can easily gain entry to the interactive information services of Dow Jones," said Allen Rehert, Director of Net 1000 Product Support. "Instead of paying for a line dedicated to Dow Jones, a single line to Net 1000 would make available to a myriad of corporate customers Dow Jones services plus other Net 1000 applications designed to address corporate business problems. It would give customers access to databases of other vendors, as well as their own plus the intelligence needed to effectively communicate between a user's corporate network and other companies," he said.

- more -

In addition to News/Retrieval, Dow Jones publishes the Wall Street Journal, Barron's magazine, domestic and overseas news wires, the Asian Wall Street Journal, The Wall Street Journal/Europe and radio and television news reports. Ottaway Newspapers, Inc., a wholly owned subsidiary, publishes 20 daily community newspapers. Richard D. Irwin, Inc., another wholly owned subsidiary, publishes college texts and professional books.

Dow Jones News/Retrieval provides 120,000 users with business and economic, securities quotes, financial and investment services, and general news and information through its 27 databases.

AT&T Information Systems, an AT&T subsidiary, designs, develops, markets and services a wide range of information movement and management products and services. Net 1000 is the shared network service component of the AT&T Information Systems product family. It provides a communications-oriented enhanced network service that combines distributed control, processing, storage and transport of information to meet the evolving needs of today's business customers.

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1/31/84



News Release

For further information contact

Dick Gundlach
(201) 898-8342

100 Southgate Parkway
Morristown, New Jersey 07960

FOR RELEASE MAY 9, 1984

AT&T is helping personnel at Norwest Mortgage get crucial mortgage decision-making data with information age speed and with up-to-the-minute accuracy.

The nation's second largest mortgage company, headquartered in Minneapolis, will use AT&T Information Systems enhanced network service to allow their people nationwide to access Net 1000 over standard telephone lines without their having to replace data terminals or personal computers or invest large amounts of money. Norwest people will be able to provide timely information to their customers whenever and wherever they choose.

The Norwest staff will have quick and convenient access to timely, accurate mortgage and price quotes in worksheet format. And, if they wish, they can obtain that information in hard copy. No longer is it necessary to transcribe information from a voice recording over the telephone and worry that inaccuracies might occur in doing so or wonder if the information is up to date. And there's never a problem with security. Unauthorized entry into the network is blocked by a unique and changeable coding system.

"These applications are just the beginning," said G.J. Regnier, AT&T Information Systems' Area Vice President, in Minneapolis. "The power of Net 1000's application architecture lets Norwest enhance their service with software additions whenever they want.

"Norwest exemplifies forward-looking companies that have come to view AT&T Information Systems as a business problem solver as well as a leading-edge communications company," added Regnier.

"Working closely with AT&T Information Systems personnel was the key ingredient to bringing a much needed enhanced service on-line quickly," said Michael B. Kern, Norwest's Assistant Vice President of Communications Services. "Net 1000 allows us to bring a remote branch up to corporate technological speed literally overnight without major capital expenditures, personnel moves or lengthy training cycles," added Kern.

Norwest Mortgage Inc., a subsidiary of Norwest Corporation, provides a broad range of mortgages through their nationwide branch offices and many correspondents.

AT&T Information Systems is the AT&T subsidiary that designs, develops, markets and services a wide range of information movement and management products and services. Net 1000 is the shared, distributed, intelligent network of AT&T-IS' Enhanced Network Services organization that provides customized communications-based solutions to business problems.

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News Release

For further information contact

Dick Gundlach
AT&T Information Systems
(201) 898-8342

100 Southgate Parkway
Morristown, New Jersey 07960

Larry Bailey
Envoy Corporation
(615) 885-3700

FOR RELEASE MAY 21, 1984

AT&T today announced that it will provide enhanced network services to the ENVOY Corporation, a financial service company based in Nashville, Tennessee.

The network service will link ENVOY point-of-sale terminals with their host computers to provide low-cost, rapid transmission of volumes of transaction data, as well as network management.

ENVOY Corporation plans to use the capacity of AT&T Information Systems' enhanced network service to quickly deploy financial services to provide merchants of subscribing banks with efficient, low-cost, point-of-sale services. Such services as bankcard debit/credit authorization and electronic capture and balance of sales transactions at the point-of-sale before any data is transmitted will help reduce paper-handling costs for all concerned.

The first application of the enhanced network services is at the Louisiana Exposition in May where ENVOY is providing for full electronic capture of point-of-sale bankcard drafts and authorizations. "The First National Bank of Commerce of New Orleans and the Louisiana World Exposition Merchant's Association has selected us as the official provider of electronic financial services for the 1984 World's Fair," said Larry Bailey, ENVOY Corporation vice president of marketing.

Ed Onimus, AT&T Information Systems area vice president in Birmingham, Alabama said, "We are pleased to be working with an innovative company like ENVOY. Our people have worked closely with ENVOY to tailor our network services to suit their particular business needs."

Allen Rehert, AT&T Information Systems director of customized services, said, "The enhanced network service is efficient and cost effective for large and small financial companies offering a wide variety of financial services such as credit/debit authorization, point-of-sale verification, and bank transactions."

According to Bailey, ENVOY's goal is to make electronic point of sale as simple as making a phone call. "To accomplish that," he said, "it's essential we have the ability to respond rapidly to customer demand. For us to deliver low-cost services to financial institutions of all sizes, we are coupling our state-of-the-art, point-of-sale system and the resources and reliability of AT&T Information Systems' enhanced network service."

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FORMS ATTACHED
INPUT

PARK 80 PLAZA WEST-1, SADDLE BROOK, NEW JERSEY 07662

(201) 368-9471

January 30, 1984

Ms. Chris Dunlap
Senior Market Researcher
General Electric Information Services
401 North Washington Avenue
Rockville, MD 20850

1450 Research
2700 Rte 1
Take a right hand turn
from right hand turn - left
next door to bank

Dear Ms. Dunlap:

It was a pleasure speaking with you and your colleagues regarding GEISCO's research needs in the Value Added Network arena. As things have developed, it appears that there are separate but related informational needs in the areas of competitive analysis and user needs, plans and intentions. It is our understanding that you will use the information and analyses to be developed in your own planning activities for this market. Because we have since jointly identified multiple needs that potentially enlarge the scope of the project beyond the initial request for competitive analysis of Tymnet, I have taken the approach of modularizing the project into groups of deliverables from which you ~~my~~ choose.

COMPETITIVE ANALYSIS

Option 1. This option is the base competitive analysis of Tymnet. We would propose a market and financially driven approach to this with technological factors covered as they influence the prime dimensions. The following is proposed for inclusion:

- Financial-- Cost analysis trends in costs, trends in prices, pricing analysis, traffic vs. cost analysis, telecommunications expenditures, capital expenditures, AT&T tariff change effects and any other measures which are of interest to you and for which data is available.



- Marketing-- Sales methods, sales staffing, known prime customers, main products and applications (by customer when available), sales organization and philosophy, commission structure as known.
- Product Development-- Overview of current activities in DTS, MDS and terminals plus such information as can be obtained on recent and future service enhancements.
- Management-- Management's view of the marketplace, key trends and events, likely role of new AT&T and other vendor transmission products. Additionally we will probe the relationship of vendor to the entire company which we believe to be a key issue.
- Promotional and Documentation Materials-- All current and recent brochures, flyers and other promotional pieces plus user documentation and price lists will be provided as a part of the analysis.
- Positioning-- The strategic and tactical position of the vendor will be set forth and fully analyzed.

Option 2. This option includes option 1. (Tymnet) and replicates the data gathering and analysis for the second prime vendor, GTE Telenet. Additionally, the practices of the two vendors will be compared and contrasted with particular attention to Telenet's lack of profitability and the different philosophies regarding security which characterize the two vendors. Telenet's relationship with AT&T IS will also be explored. Option 2. is considered to be much more powerful than option 1. and may be considered a recommended minimum.

Option 3. This option expands the study to include the activities of IBM and AT&T. It is recognized that AT&T now has dual participation in the form of offerings from both the regulated and unregulated segments of the company and that there are points of competition between the two which are sometimes acute. In this section particular attention will be paid to analysis of the regulated unit which is frequently overlooked and the activities of which are both opportunities and threats to certain possible GEISCO strategies. IBM's I/N offerings will be similarly analyzed. All analysis here will follow along the lines earlier proposed with the exception of financial analysis for which data is unavailable due to the bundled nature of these enterprises. INPUT has management level contacts in these organizations which we expect to tap for this study.

Option 4. This option is a limited addition to the above and is proposed to include the activities of the second tier VAN participants including ADP, Boeing, Compuserv, Computer Sciences, Dun & Bradstreet and United Telephone. Emphasis will be placed on potential upsets and pre-emptions which could result from the activities of these vendors. Basic competitive data will be provided, unique pricing approaches analyzed and individual variations identified, including potentially significant resale of major vendor services. The approach proposed is one of highlighting deviations from conventional strategies and unpacking the reasons for those deviations. This approach will be used to limit the costs associated with analyzing the second tier vendors and will emphasize major tactical departures.

MARKET ANALYSIS

For market analysis, we propose a proprietary replication exclusively for GEISCO of a December 1982 study by INPUT (of which I am the author) on the VAN market. The study, Market Opportunities In Network Services, covers:

- User Characteristics in depth.
- Reviews leading applications by segment.
- Examines international traffic.
- Explores leading applications by expenditure.
- Analyzes satisfaction with current vendors (in 13 dimensions).
- Unpacks future use and unmet needs.
- Analyzes traffic by transmission characteristics.
- Examines user actions to multiple price and technical scenarios.

For GEISCO, we propose that certain modifications to the study design be made. Specifically, we would suggest a further segmentation of industrial and financial users and we would recommend that key differentiating characteristics of GEISCO's network offering be tested, particularly in the areas of 3270 capability and pricing. By replicating this study (with appropriate modifications) GEISCO will obtain very powerful comparative and proprietary information of great utility in business planning. With such a study, Mark-Net planners will have an understanding of the dynamics of the VAN market available to no other firm.

When such a study is combined with the competitive analysis of the major vendors a virtually complete strategic and tactical planning package results. The combined approach is highly recommended by INPUT as we believe it will yield the highest degree of actionable marketplace understanding by combining reliable information from both users and competitors. To tune the proposed study to GEISCO's specific requirements will require some consultation before implementation. This consultation is included in the preliminary price estimates which follow.

SCHEDULE AND FEE ESTIMATES

To aid GEISCO in determining an appropriate level of effort, we are setting forth preliminary estimates of scheduling and fees for each option. They are presented in the same order as in the option descriptions and are inclusive of all costs, save incidentals such as travel which normally do not exceed 5% of fees. Scheduled durations are based on receipt of a signed contract for the engagement and presume a start within thirty days of the date of this letter.

<u>Option Description</u>	<u>Elapsed Time</u>	<u>Fee Estimate</u>
Tymnet Analysis (1)	30	\$11,900
Tymnet & Telenet (2)	45	\$20,400
Tymnet, Telenet, IBM, ATTCOM & ATTIS (3)	60	\$30,200
Tymnet, Telenet, IBM, ATTCOM & ATTIS plus second tier (4)	67	\$34,900

VAN market & user survey (5)	45/60	\$25,000-\$40,000

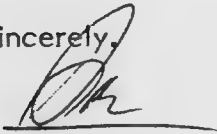
Please note that options one through four are separate from option five. This is to say that any option may be elected from one through four. The price of this option will be added to option five. Unfortunately, it is not yet possible to provide a firm estimate for option five based on available information. Since various segmentations and questionnaire lengths heavily influence costs, a probable range is provided for this option. Substantial savings are possible by the simultaneous election of option five plus another option such as four. These savings may run as high as 10% of the total fee and result from the elimination of duplicate overhead, administrative and



travel expenses. In the interest of efficiency INPUT recommends this approach. For contractual purposes, a fixed fee will be established for the actual option combination selected.

We believe that the above constitutes the essence of our conversations and sets forth the major points which were discussed. We look forward to continuing our dialogue to determine the specifics of how INPUT can best meet GEISCO's needs in research and analysis of the VAN marketplace and its competitors. Thank you for thinking of INPUT.

Sincerely,

A handwritten signature in dark ink, appearing to be 'DWF', written over a horizontal line.

Donald W. Fostle
Principal Consultant

DWF/lcg

Ms. Chris Dunlap
Senior Market Researcher
General Electric Information Services
401 North Washington Avenue
Rockville, Maryland 20850

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COMPETITIVE ANALYSIS
~~Option 1~~ ^{Option} 1. This ^{new} ~~base~~ study of Tymnet, ^{for} competitive analysis.

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When such a study is combined with the competitive analysis of the major vendors a virtually complete strategic and tactical planning package results. The combined approach is highly recommended by INPUT as we believe it will yield the highest degree of ^{actionable} ~~practical~~ understanding ~~of the marketplace and combine~~ reliable information from both users and competitors. To tune the proposed study to GEISCO's specific requirements will require some consultation before implementation. This consultation is included in the ^{preliminary} price estimates which follow.

SCHEDULE & FEE ESTIMATES

To aid GEISCO in determining an appropriate level of effort, we are setting forth preliminary estimates of scheduling and fees for each option. They are presented in the same order as in the option descriptions and are inclusive of all costs, save incidentals such as travel which normally do not exceed 5% of fees. Scheduled durations are based on receipt of a signed contract for the engagement and presume a start within thirty days of the date of this letter.

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Sincerely, DWF

FROM THE DESK OF

Gay R. Adams

12/6/83

Ed -

GEISCO wants to know if we can do this custom research on Tysnet. I have to respond after the holidays with a yes or no. This study was done in late Fall '82 by PACTEL and PACTEL is their second choice. GEISCO will cut the contract in Jan./Feb. and would expect a 2 month duration for the work.

The two most important areas for them are the organizational structure and the financials. They are particularly interested in the

Item PP 180 Wheeler Group Inc

→ Art Hyder -

(301) 340-5043

with 11/23/83

with 11/24/83

✓ Lynn Bauer

5-15 hr

(301) 340-5241

11/23/83 340-4000

number of sales people/city
and marketing people.

I still have some Tynshare
contacts, so I'll see what I
can come up with. GEISCO
expects us to sub some of
the work out.

Please call me on this.

Ray

COMPETITIVE INFORMATION REQUIREMENTS

VAN MARKETPLACE

VENDORS SURVEYED:

- TYMNET ← ONLY
- TELENET

0* ORGANIZATIONAL STRUCTURE (INCLUDING ORG CHARTS)

- HEADQUARTERS
- REGIONAL/FIELD
- PERSONNEL/STAFF LEVELS

0* TECHNOLOGY/CAPABILITIES

- EQUIPMENT: CONCENTRATORS, MULTIPLEXORS, ETC.
- CAPACITIES/THROUGHPUT
- SYNCH VS. ASYNCH
- PROTOCOL SUPPORT/FLEXIBILITY
- LINE SPEED SUPPORT/FLEXIBILITY
- ONSITE EQUIPMENT OFFERED

ARCHITECTURE

MONITORING/CONTROL CAPABILITIES

- SWITCHING CAPABILITIES
- DIAL-OUT CAPABILITIES
- COST IMPACTS OF ABOVE

0 DEPLOYMENT

- LOCATIONS
 - BY LINE SPEED SUPPORTED
 - BY PROTOCOL SUPPORTED
 - OTHER CONSTRAINTS
- NUMBER/CAPACITY OF LINES
- COST IMPACTS OF ABOVE

0 STATISTICAL INFORMATION

- TOTAL NUMBER OF CUSTOMERS (SUBSCRIBERS)
- NUMBER OF USERS PER SUBSCRIBER
- BREAKOUTS OF ABOVE BY PROTOCOL/LINE SPEED
- TRAFFIC MEASUREMENTS
 - AVERAGE PER CUSTOMER
 - BY PROTOCOL
 - BY LINE SPEED
- HOSTS SUPPORTED BY VENDOR
- PROTOCOLS USED BY VENDOR

0 CURRENT OPERATIONS

signature known about 2/28/84

(301) 340-4960

Chris Dunlap

Mr. M. K.

21 M. M. K.

21 M. M. K.

Mr. M. K.

Mr. M. K.

Mr. M. K.

KAMADA

1430 Rhode Island NW

- PERCEIVED REPUTATION FOR RELIABILITY, AVAILABILITY AND CUSTOMER SUPPORT ✓
- ACTUAL RELIABILITY/AVAILABILITY
- CUSTOMER SUPPORT CAPABILITY
- TECHNOLOGICAL SOPHISTICATION/EXPERTISE
- CUSTOMER EQUIPMENT/SERVICE CONFIGURATIONS
- BILLING PROCESS/PROCEDURES

0* FINANCIAL INFORMATION ✓

- CURRENT TARIFFS(DOMESTIC/INTERNATIONAL)
- FINANCIAL STATEMENTS
- FINANCIAL HISTORY/TRENDS
- COST ALLOCATION METHODOLOGY
- FORECASTS/PROSPECTS

0 MARKETING STRATEGIES ✓

- MARKETS/INDUSTRIES/APPLICATIONS TARGETED
- PRICING STRATEGIES
 - STRUCTURE
 - BUY VS. LEASE OPTIONS
 - LEVELS
- COMMERCIALIZATION APPROACH
- CUSTOMER PROFILE (TYPICAL, LARGEST, ETC.)

0 CUSTOM DEVELOPMENT/CONSULTING SERVICES OFFERED

- PUBLIC NETWORKS
- PRIVATE NETWORKS

0 VALUE ADDED SERVICES

- ELECTRONIC MAIL
- PROTOCOL CONVERSION
- OTHERS
- COMPOSITION OF SERVICE OFFERING (PURE DATA COMMUNICATIONS % VS. VALUE ADDED OFFERINGS)
- CUSTOMER USAGE CHRONOLOGY (COMMUNICATIONS LEADING TO ELECTRONIC MAIL FOR EXAMPLE)

0 OTHER INFORMATION

- PRODUCT DEVELOPMENT PLANS ←
- LONGER TERM BUSINESS STRATEGIES
- OTHER OPERATIONS/BUSINESSES/SUBSIDIARIES
- INTERNATIONAL STRATEGIES (THE INTERNATIONAL ASPECTS OF ALL OF ABOVE INFORMATION SHOULD BE DISCUSSED UNDER THE APPROPRIATE CATEGORY)

YCHP 488-7123 -981

MYAIR 586-2300 #312 85-8Pov

393-4000

1-24-1-

(413) -224-~~8494~~

8161-

J. 52 - McGILL U.

McGILL U.
4 C.E.A.S. S.

INPUT

ORDER/INVOICE/FULFILLMENT

ORIGINATOR (SIGNATURE) [Signature]PREPARED BY: DWFDATE: 3/30/84

ACTIVITY	<input checked="" type="checkbox"/> NEW ORDER	<input type="checkbox"/> FULFILLMENT ONLY	COMMISSION TO: <u>DWF 600</u> %	SOLD BY: <u>DWF 600</u> %	APPROVED INITIAL DATE
	<input type="checkbox"/> CONTINUATION	<input type="checkbox"/> SINGLE INVOICING			
	<input type="checkbox"/> CHANGE	<input checked="" type="checkbox"/> MULTI-INVOICING: <u>2</u>			
	<input type="checkbox"/> CANCEL	NO. INVOICES			
	<input type="checkbox"/> SPECIAL:	<input type="checkbox"/> PENDING:			
PRODUCT	<input type="checkbox"/> SUBSCRIPTION	US <input checked="" type="checkbox"/> UK	PROJ. I.D./YEAR	TITLE OR DESCRIPTION	AMOUNT
	<input checked="" type="checkbox"/> CUSTOM		<u>YVEG</u>	<u>VAN COMPETITIVE ANALYSIS</u>	<u>134,900</u>
	<input type="checkbox"/> MULTICLIENT				
	<input type="checkbox"/> REPORTS				
	<input type="checkbox"/> COPIES				
	<input type="checkbox"/> CONSULT/PRESENT.				
	<input type="checkbox"/> TAPES/MATERIALS				
<input type="checkbox"/> REIMBURSED COSTS					

CLIENT AUTH. P.O. # F71-84E-1650 INPUT CONTRACT ☐ LETTER ☒ VERBAL ☐
ATTACH ALL AUTHORIZING DOCUMENTS TO WHITE (CONTRACT) COPY.

ORIGINATOR

SHIP TO:*	NAME <u>MS. CHRIS DUNLAP</u>	INVOICE TO: (IF DIFFERENT)
	TITLE <u>SR. MKT RESEARCHER</u>	NAME
	COMPANY <u>GEISCO</u>	TITLE
	ADDRESS <u>401 N. WASHINGTON ST</u>	COMPANY
	<u>ROCKVILLE, MD. 20850</u>	ADDRESS
PHONE <u>(301) 340-4690</u>	PHONE ()	

INVOICE

* ☐ Check here if more than one shipping address and attach names and addresses to green (fulfillment) copy. * ☐ Check here for address change to mail list.
INVOICE TO READ: (FOR OTHER THAN STANDARD WORDING)

SPECIAL INSTRUCTIONS FOR HANDLING, BILLING, STAGGERED OR DELAYED PAYMENTS, ETC.

O.I.F. ONLY

INV. COMP.	BY:	DATE:	CLIENT #:	ORDER #:	INV. #:	MULTI-INVOICING OF
------------	-----	-------	-----------	----------	---------	-----------------------

ORIGINATOR/SHIPPING

FULFILLMENT

ITEM DESCRIPTION OR TITLE	NO.	BY	DATE	ITEM DESCRIPTION OR TITLE	NO.	BY	DATE

FULFILLMENT TO BE COMPLETED IN: ☐ PALO ALTO ☐ LONDON ☐ OTHER

TITLE VAN COMPETITIVE ANALYSIS

CLIENT GEISCO

CONTRACT: ATTACHED ☐ TO FOLLOW ☐ LETTER ☐ VERBAL ☐

PROJECT LEADER FOSTLE CODE YVEG

DATE STARTED 4/4/84 PLANNED COMPLETION DATE 7/1/84

LEVEL OF EFFORT (Professional Man Days) 29

TOTAL CONTRACT VALUE: \$ 34,900

REVENUE DISTRIBUTION (% or \$) INPUT US 100 INPUT LTD ☐

REIMBURSABLE EXPENSES: NO ☐

YES ☒

EXP. BUDGET \$1500⁰⁰ NTE

TO COVER: TRAV: ☒

TEL: ☐

RPT. PREP.: ☐

OTHER: ☒

BILLING SCHEDULE DESCRIPTION TWO INVOICES 50/50

PROJECT DESCRIPTION ANALYZE CURRENT STATUS OF
TELENET, TYMNET, AT&T, IBM AND MINOR VANS
W/ RESPECT TO PRODUCT, Mktg. METHODS &
AVAILABLE FINANCIAL DATA. UNPACK STRATEGIC
IMPLICATIONS FOR GEISCO.

INDICATE TYPE OF CUSTOM WORK: REPORT ☐ PRESENTATION ☒

THANK YOU PACKAGE: YES ☐ NO ☒

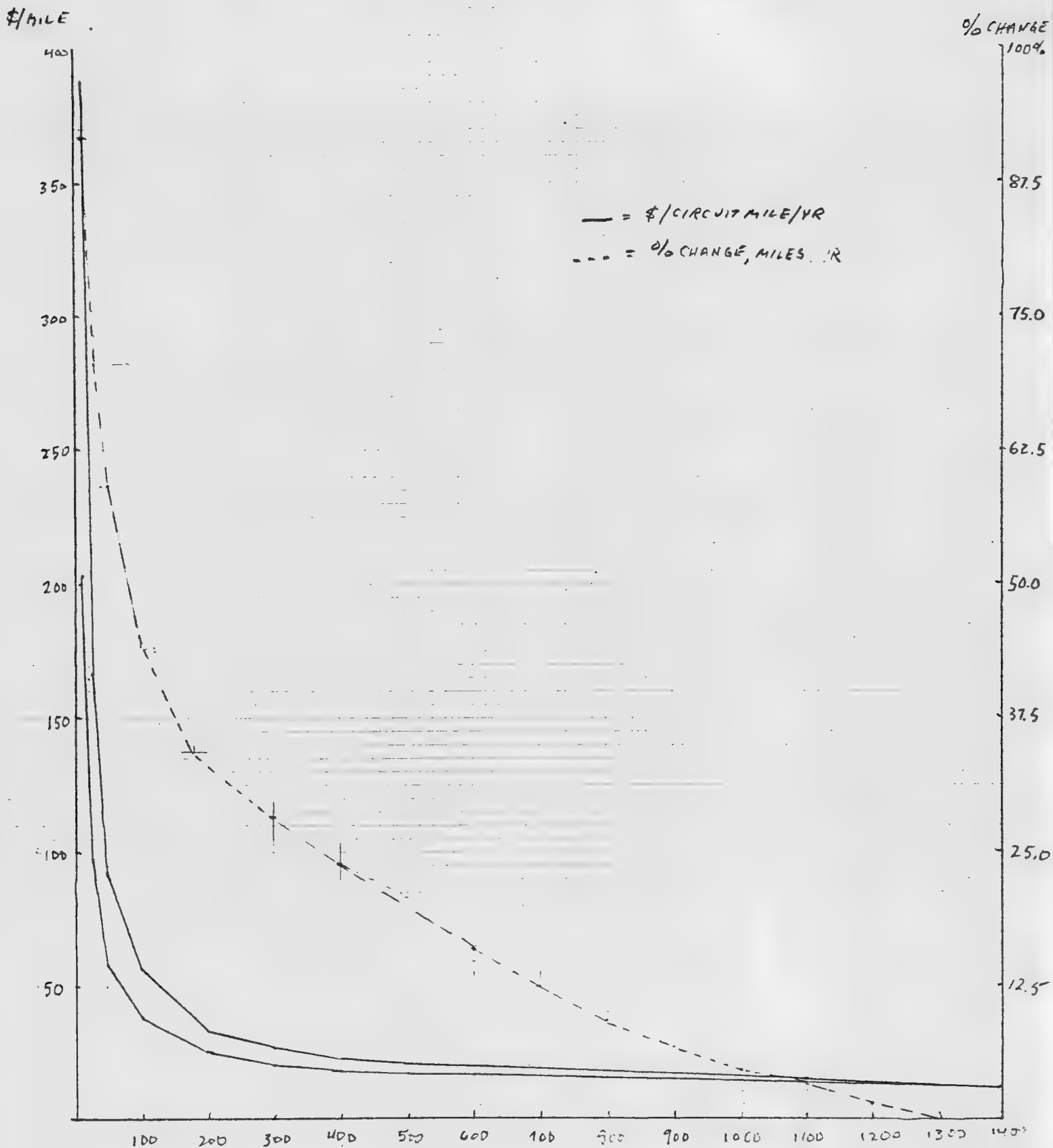
11

AT&T NET 1000 SERVICE
Product Description

Chapter 5 contains the following information modules:

	<i>Filename</i>	<i>Issue</i>
1	%W%	
2	%W%	

AT&T INTERSTATE
OCT 1983 PL TARIFFS VS. PRIOR PRICING

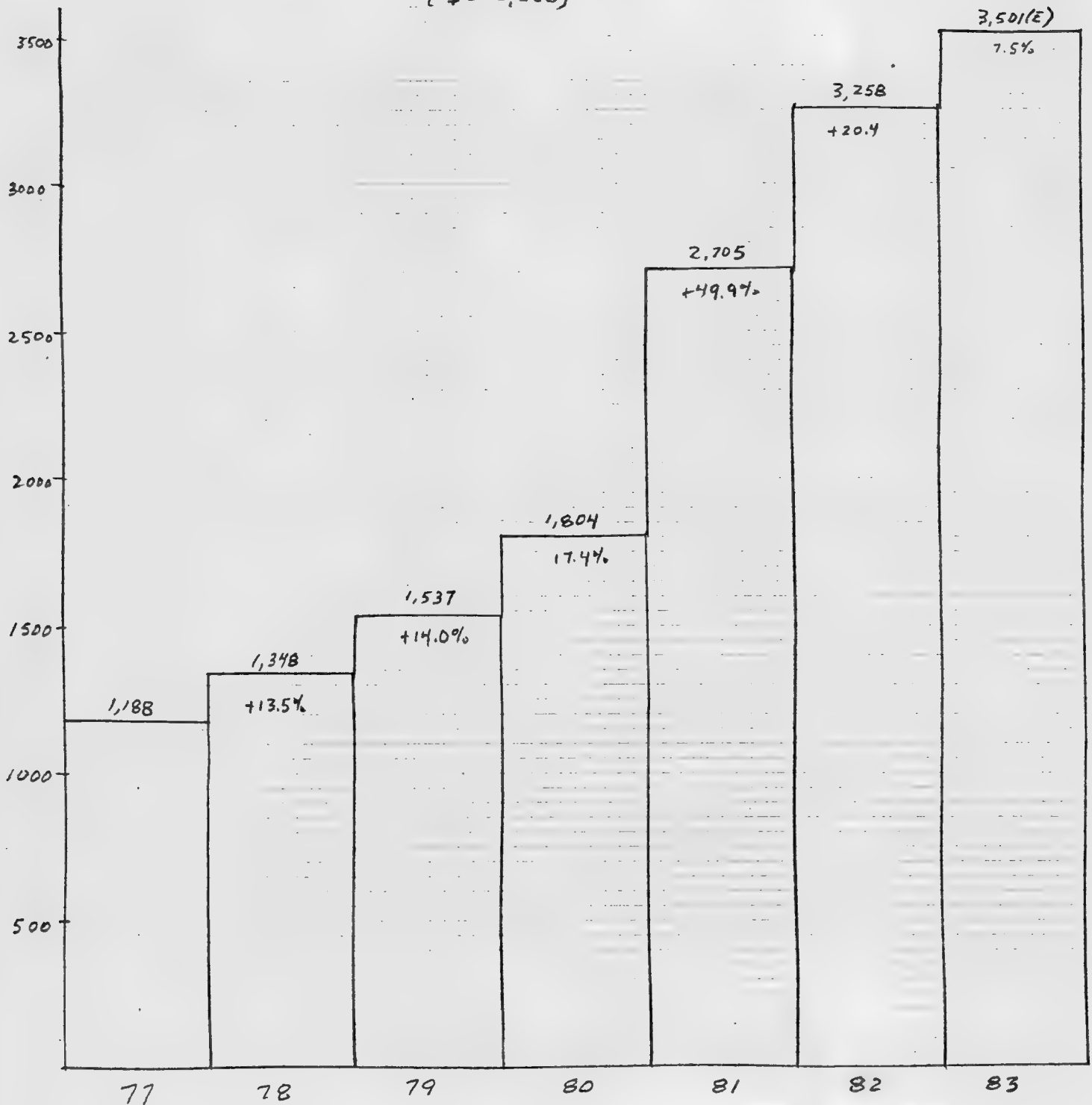


BELL SYSTEM PRIVATE LINE

INTERSTATE REVENUE

1977-1983

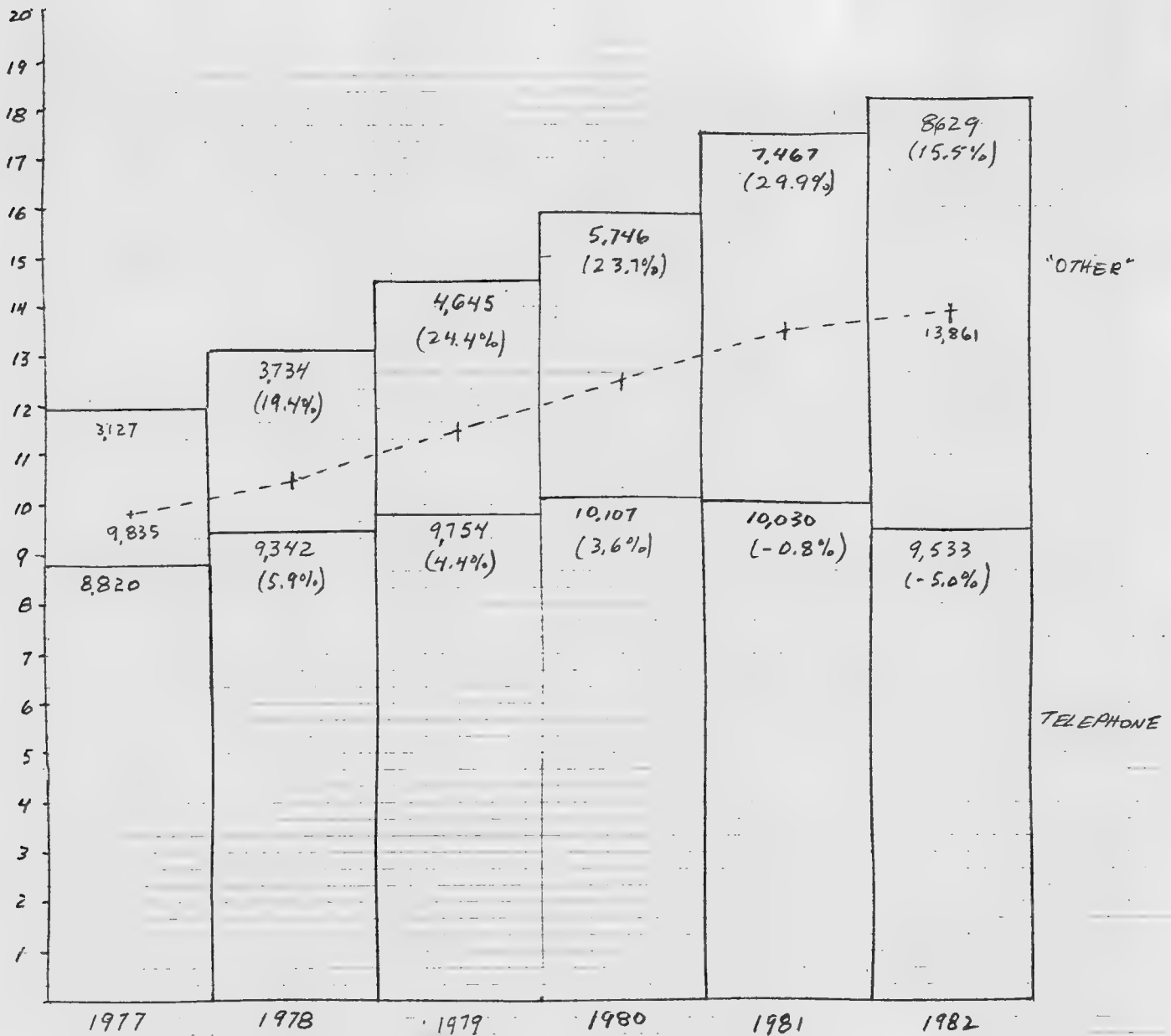
(\$000,000)



AVERAGE ANNUAL REVENUE GROWTH, INTERSTATE PRIVATE LINE = 19.7% 1977-1983

" " " " " " " " = 22.4% 1977-1983

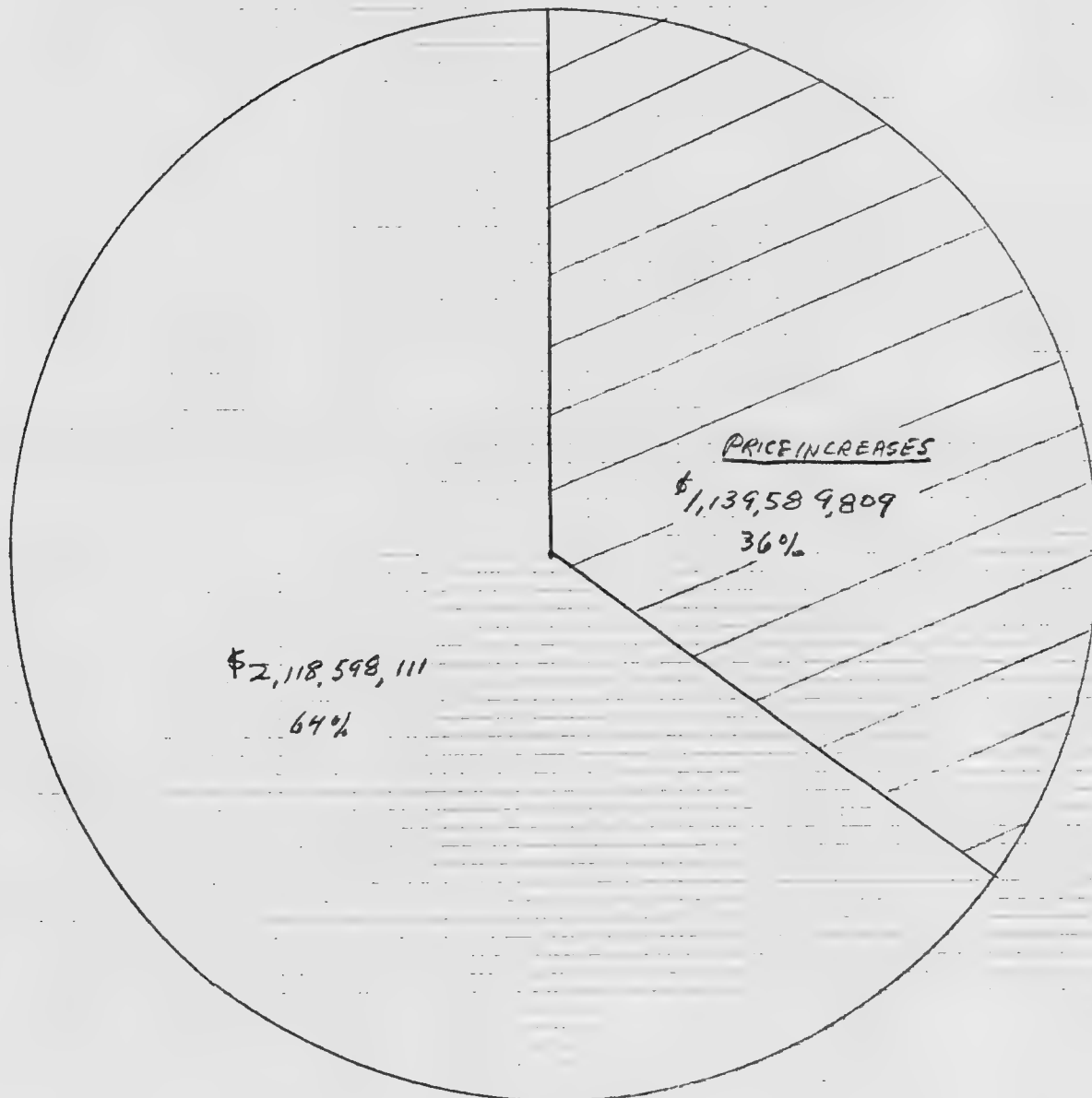
BELL SYSTEM PRIVATE LINE
INTERSTATE CUSTOMERS
1977-1982



AVERAGE ANNUAL GROWTH TELEPHONE PRIVATE LINE = 1.6%
 " " " "OTHER" (DATA) PRIVATE LINE = 22.5%
 " " " "TOTAL PRIVATE LINE = 7.1%

BELL SYSTEM INTERSTATE PRIVATE LINE

SHARE OF REVENUE DUE
TO
PRICE INCREASE
1977 VS. 1982



\$ 3,258,188,000

"REAL" REVENUE GROWTH = 12.3 % (CIRCUIT MILES)

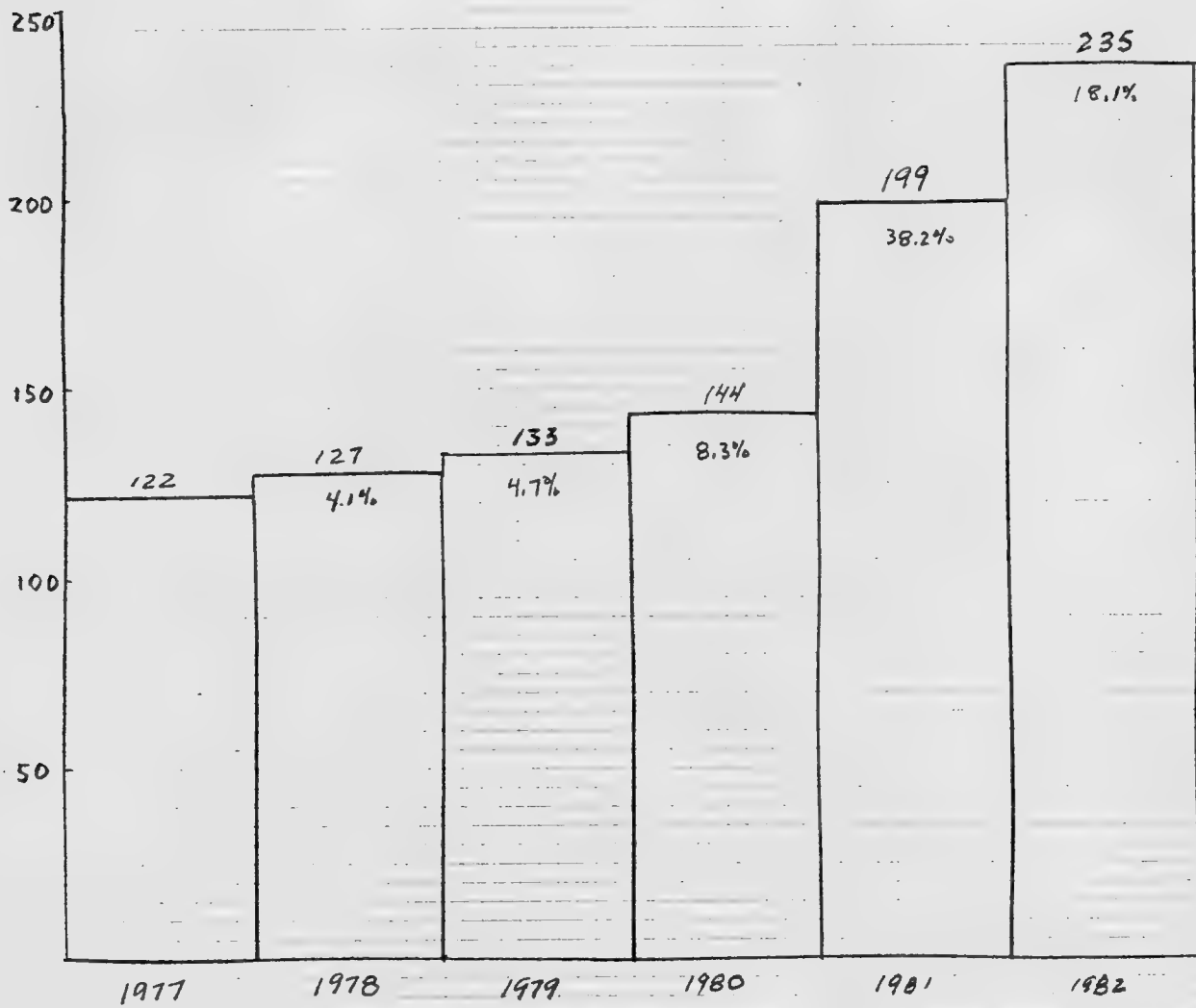
REPORTED " " 22.4 % (CIRCUIT MILES PLUS PRICE INCREASES)

AVERAGE ANNUAL BILL PER CUSTOMER

INTERSTATE PRIVATE LINE

1977-1982

(\$000)



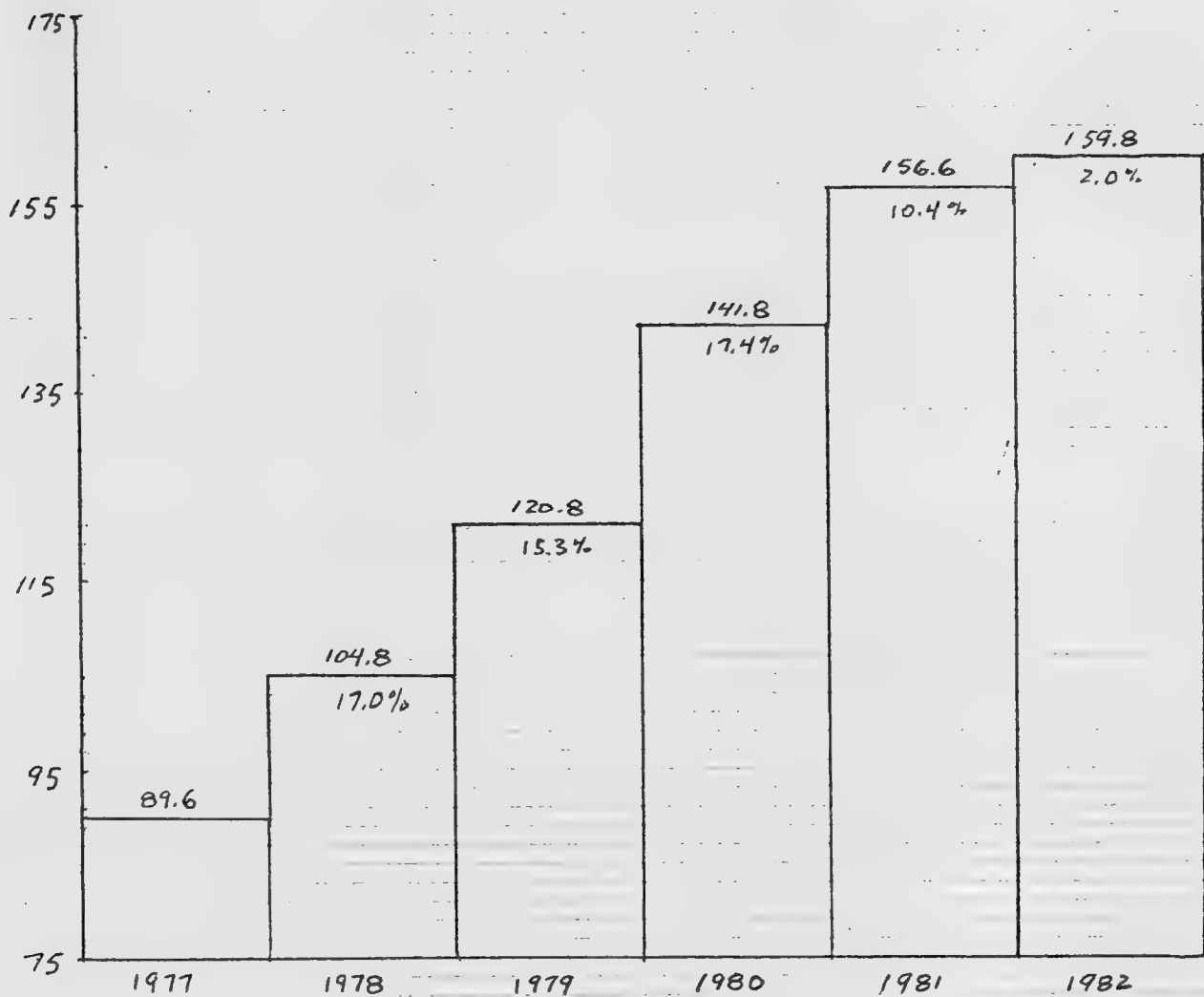
AVERAGE ANNUAL BILL GROWTH = 14.2% 1977-1982

BELL SYSTEM PRIVATE LINE

INTERSTATE CIRCUIT MILES

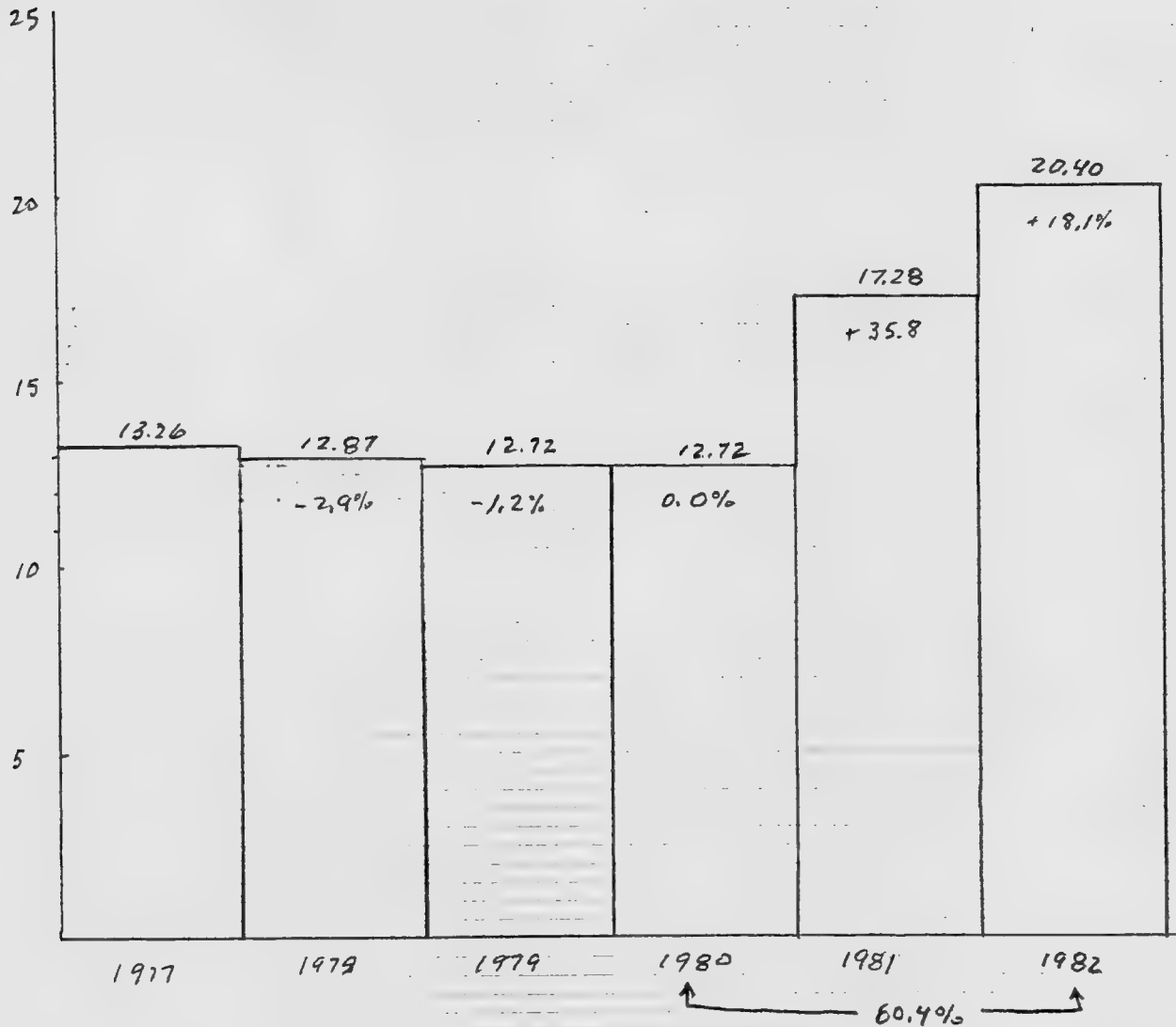
1977-1982

(000,000)



AA4R CIRCUIT MILES, 1977-1982 = 12.3%

BELL SYSTEM PRIVATE LINE
 INTERSTATE REVENUE PER
 CIRCUIT MILE
 1977-1982
 (\$)



1977-1982 AAGR REVENUE PER CIRCUIT MILE = 9.0%

1979-1982 " " " " = 17.1%

1972 REVENUE PER CIRCUIT MILE = \$14.19



INTERSTATE DATA

LONG DISTANCE INTERSTATE REVENUE DATA UNDER DRC 1962 — 1962 (in Thousands)

	1962	1963	1964	1965	1966	1967
GROSS REVENUE						
Interstate						
Message — Telephone Domestic (See Note ①)	2,044,249	2,219,721	2,485,370	2,763,777	3,234,747	3,576,156
" — " All Other (See Note ②)	62,850	65,334	67,386	68,255	70,744	62,076
" — Teletypewriter (See Note ③)	2,107,099	2,285,055	2,552,756	2,832,032	3,305,491	3,638,232
Total Message						
Less Franked & Withdrawn						
DATA — PHONE 50 (See Note ④)						
Wide Area — Telecommunications —						
Conterminous US			127,996	163,247	201,496	236,609
" — Data — All Other			1,332	890		
Total Wide Area Services (See Note ⑤)	56,530	93,444	129,328	164,137	201,496	236,609
Private Line — Telephone			107,275	106,034	130,118	145,008
" — Teletypewriter			90,440	96,710	94,400	94,483
" — DP® Digital Services						
" — Other Telegraph			2,671	2,572	2,502	2,485
" — Multipurpose Wideband			100,993	115,012	145,182	167,143
" — Program — Audio			21,413	21,861	22,494	21,163
" — Program — Television			41,976	43,532	47,322	48,175
" — Other Services			14,806	16,617	18,056	24,940
Local Private Services Interstate						
Toll Private Line Services Interstate						
Total Private Line (See Note ⑥)	348,845	362,162	379,574	402,338	460,074	503,397
Other Toll Svc. Revenues (See Note ⑦)						
Rent Revenues — Long Lines	21,410	23,906	21,961	22,480	25,486	28,760
Other Miscellaneous Revenues — Long Lines	3,850	4,070	4,560	5,246	5,687	6,695
Interest Charged Construction						
Associated Companies	6,132	6,075	6,931	7,996	9,479	11,157
Long Lines	5,877	7,667	11,073	11,315	15,347	15,007
Total	12,009	13,742	18,004	19,311	24,826	26,164
Less: Provision for Uncollectibles (See Note ⑧)	13,249	15,239	17,528	20,702	25,467	34,327
Total Interstate	2,536,493	2,767,140	3,088,655	3,424,842	3,997,593	4,405,530
SETTLEMENTS EXCEPT DIV. OF REVENUES						
Made by Associated Companies	131,592	152,704	173,636	201,662	252,497	284,764
Made by Long Lines	93,279	104,541	128,595	155,186	181,981	209,871
Total	224,871	257,245	302,231	356,848	434,478	494,635
DIVISION OF REVENUES						
Revenues	2,311,622	2,509,895	2,786,424	3,067,994	3,563,115	3,910,895
Expenses and Other Taxes						
Associated Companies	1,174,437	1,271,318	1,387,612	1,544,933	1,766,562	1,945,494
Long Lines	405,778	421,373	469,042	517,834	580,230	647,698
Total	1,580,215	1,692,691	1,856,654	2,062,767	2,346,792	2,593,192
Federal Income Tax						
Associated Companies	236,346	265,004	281,681	287,088	347,366	367,663
Long Lines	112,079	124,657	141,943	151,793	181,337	199,080
Total	348,425	389,661	423,624	438,881	528,703	566,743
Average Net Book Costs						
Associated Companies	3,585,664	3,991,934	4,330,854	4,805,229	5,580,199	6,133,449
Long Lines	1,648,505	1,856,703	2,161,562	2,479,621	2,865,745	3,170,510
Total	5,234,169	5,848,637	6,492,416	7,284,850	8,445,944	9,303,959
% Long Lines of Total	31.48	31.75	33.3	34.0	33.9	34.1
Balance for Division						
Associated Companies	262,334	291,865	337,596	373,538	454,180	495,244
Long Lines	120,648	135,678	168,550	192,808	233,440	255,715
Total	382,982	427,543	506,146	566,346	687,620	750,960
Adjustment of Prior Settlements						
Associated Companies	574	(47)	670	1,300	1,017	1,553
Long Lines	(574)	47	(670)	(1,300)	(1,017)	(1,553)
Total Operating Revenues						
Associated Companies (See Note ⑨)	1,667,559	1,822,065	2,000,628	2,198,863	2,559,646	2,798,797
TOTAL OPERATING REVENUES						
LONG LINES (See Note ⑨)	632,054	674,088	767,792	849,820	978,643	1,085,934

Denotes negative amount

Notes on Page 102

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
7	3,576,156	3,971,879	4,624,885	4,918,181	5,526,717	6,156,871	7,143,009	6,582,654	7,309,222	8,164,429	8,981,715
4	62,076	61,046	62,135	66,568	16,500			1,308,398	1,505,045	1,810,661	2,108,082
1	3,638,232	4,032,925	4,687,020	4,984,749	5,543,217	6,156,871	7,143,009	7,891,053	8,814,268	9,975,089	11,089,797
			28	10	20	41	84	161	99	132	112
6	236,609	290,519	359,299	387,198	460,554	588,534	757,636	928,478	1,139,448	1,489,991	1,861,755
6	236,609	290,519	358,299	387,198	460,554	588,534	757,636	928,478	1,139,448	1,489,991	1,861,779
8	145,008	168,247	191,477	208,608	218,974	255,374	286,164	280,610	295,481	331,931	373,189
0	94,483	97,832	104,841	95,901	87,929	85,969	75,606	66,994	62,280	59,732	50,102
2	2,485	2,579	2,679	2,678	2,988	3,102	3,112	3,120	3,242	3,412	3,458
2	167,143	196,651	256,941	331,256	341,930	349,045	372,846	409,825	450,310	464,476	458,006
4	21,163	22,972	23,963	21,615	23,036	22,817	23,078	23,191	23,382	24,438	25,363
2	48,175	50,705	59,387	76,544	77,153	78,780	69,221	65,575	63,960	64,051	60,251
6	24,940	32,152	44,225	55,426	65,621	85,641	108,763	122,749	145,808	174,623	204,292
4	503,397	571,138	683,513	792,028	817,631	880,728	938,790	972,064	1,045,162	1,127,793	1,188,133
3	28,760	29,777	32,036	15,149	21,895	25,299	25,512	27,247	30,269	32,674	1,752
7	6,695	8,042	8,663	5,478	6,676	5,598	4,579	5,321	5,285	5,969	32,178
9	11,157	14,838	19,450	30,396	47,187	51,944	51,325	54,895	52,141	50,813	53,088
7	15,007	20,564	16,433	16,021	26,884	21,505	27,698	30,989	39,379	25,271	14,178
6	26,164	35,402	35,883	46,417	74,071	73,449	79,023	85,884	91,520	76,084	67,266
7	34,327	34,333	46,344	73,362	84,721	79,377	82,342	103,051	117,877	123,250	146,576
3	4,405,530	4,933,470	5,759,098	6,157,667	6,839,343	7,651,143	8,866,291	9,807,157	11,008,174	12,584,482	14,100,668
7	284,764	379,123	457,504	531,576	599,415	689,628	826,584	1,000,348	1,114,784	1,313,754	1,490,836
1	209,871	233,724	293,958	351,667	392,009	473,899	581,550	696,465	837,784	1,017,687	1,205,880
8	494,635	612,847	751,462	883,243	991,424	1,163,527	1,408,134	1,696,813	1,952,568	2,331,441	2,696,716
5	3,910,895	4,320,623	5,007,636	5,274,424	5,847,919	6,487,616	7,458,157	8,110,344	9,055,606	10,253,041	11,403,952
2	1,945,494	2,193,561	2,532,183	2,875,351	3,224,119	3,624,378	4,070,864	4,521,167	5,083,561	5,721,686	6,406,732
0	647,698	696,516	809,445	927,078	993,058	1,082,111	1,199,095	1,321,463	1,468,303	1,703,572	1,883,773
2	2,593,192	2,890,077	3,341,628	3,802,429	4,217,177	4,706,489	5,269,959	5,842,630	6,551,864	7,425,258	8,290,505
6	367,663	427,532	479,765	354,794	383,029	410,614	521,325	529,328	589,367	677,238	761,150
7	199,080	238,195	282,510	218,294	208,651	223,548	274,256	250,829	273,216	316,747	337,186
3	566,743	665,727	762,275	573,088	591,680	634,162	795,581	780,157	862,583	993,985	1,098,336
9	6,133,449	6,837,447	7,562,991	8,435,407	9,684,801	10,973,483	12,243,155	13,492,898	14,605,326	15,771,431	17,129,237
5	3,170,510	3,520,157	3,752,603	3,904,580	4,173,719	4,417,866	4,593,112	4,793,502	4,999,125	5,073,088	5,046,753
4	9,303,959	10,357,604	11,315,594	12,339,987	13,858,520	15,391,349	16,836,267	18,286,401	19,604,452	20,844,519	22,175,990
9	34.1	34.0	33.2	31.6	30.1	28.7	27.3	26.2	25.5	24.3	22.8
0	495,244	504,854	604,086	614,399	726,001	817,823	1,012,710	1,097,985	1,222,840	1,387,581	1,556,663
0	255,716	259,965	299,647	284,508	313,061	329,142	379,907	389,572	418,319	446,217	458,448
0	750,960	764,819	903,733	898,907	1,039,062	1,146,965	1,392,617	1,487,557	1,641,159	1,833,798	2,015,111
7	1,553	(437)	(65)	1,087	(1,667)	(246)	(531)	(963)	(1,838)	(39)	(119)
7)	(1,553)	437	65	(1,087)	1,667	246	531	963	1,838	39	119
6	2,798,797	3,110,672	3,596,519	3,815,235	4,284,295	4,800,625	5,553,043	6,092,622	6,841,789	7,735,653	8,671,338
3	1,085,934	1,174,549	1,375,234	1,412,772	1,489,553	1,613,542	1,826,091	1,931,840	2,122,298	2,441,308	2,665,348

1976	1977	1978	1979	1980	1981	1982
4,429	8,981,715	10,200,261	11,448,867	12,709,351	14,680,398	16,019,690
0,661	2,108,082	2,598,898	3,281,392	4,037,742	4,596,112	4,223,022
5,089	11,089,797	12,799,159	14,730,259	16,747,093	19,276,510	20,242,712
132	112	314	549			
9,991	1,861,755	2,233,452	2,603,799	3,068,148	3,781,181	4,794,422
	24	3,033	7,657	13,983	22,304	25,652
9,991	1,861,779	2,236,485	2,611,456	3,082,131	3,803,485	4,820,074
11,931	373,189	443,542	505,753			
19,732	50,102	43,060	37,364			
5,130	13,472	22,893	43,243			
3,412	3,458	3,542	3,619			
14,476	458,006	448,170	477,624			
14,438	25,363	27,249	29,534			
14,051	60,251	63,801	66,296			
14,623	204,292	295,565	373,533			
				19,068	28,937	34,517
				1,784,826	2,676,265	3,224,271
				1,803,894	2,705,202	3,258,788
				24,565	85,232	109,538
12,674	32,178	38,877	49,015	79,934	44,075	44,690
5,969	6,227	7,416	7,751	14,945	22,580	12,685
10,813	53,088	62,328	25,199	35,315	33,503	32,995
15,271	14,178	21,180	25,380	27,873	34,315	39,882
16,084	67,266	83,508	50,579	63,188	67,818	72,877
13,250	146,576	193,716	258,798	259,433	327,000	414,660
14,482	14,100,668	16,324,315	18,735,793	21,549,317	25,677,902	28,146,704
3,754	1,490,836	1,796,456	2,137,413	2,544,864	3,084,411	3,550,304
7,687	1,205,880	1,494,094	1,938,456	2,336,797	2,904,617	3,033,092
11,441	2,696,716	3,290,550	4,075,869	4,881,661	5,989,028	6,583,396
13,041	11,403,952	13,033,765	14,659,924	16,667,656	19,688,874	21,563,308
11,686	6,406,732	7,284,165	8,434,411	9,771,326	11,374,471	12,737,751
13,572	1,883,773	2,054,280	2,351,382	2,637,466	3,021,764	3,342,489
15,258	8,290,505	9,338,445	10,785,793	12,408,792	14,396,235	16,080,240
17,238	761,150	936,546	913,325	951,599	1,236,519	1,299,917
6,747	337,186	391,394	361,532	372,050	450,012	493,357
13,985	1,098,336	1,327,940	1,274,857	1,323,649	1,686,531	1,793,274
11,431	17,129,237	18,973,048	21,301,857	24,104,846	26,709,714	27,864,986
13,088	5,046,753	5,079,219	5,149,179	5,448,708	6,036,319	6,596,778
14,519	22,175,990	24,052,267	26,451,036	29,553,554	32,746,033	34,461,765
24.3	22.8	21.1	19.5	18.4	18.4	19.1
17,581	1,556,663	1,867,399	2,092,665	2,394,222	2,941,535	2,984,189
16,217	458,448	499,981	506,609	540,993	664,573	705,605
13,798	2,015,111	2,367,380	2,599,274	2,935,215	3,606,108	3,689,794
(39)	(119)	1,413	1,424	6,289	1,527	3,054
39	119	(1,413)	(1,424)	(6,289)	(1,527)	(3,054)
15,653	8,671,338	10,027,195	11,416,626	13,081,832	15,516,683	16,991,916
11,308	2,665,344	2,923,062	3,192,719	3,516,347	4,101,319	4,504,623

GROSS REVENUE

Interstate

Message — Telephone Domestic (See Note ①)
 " — " All Other (See Note ②)
 " — Teletypewriter (See Note ③)

Total Message

Less Franked & Withdrawn

DATA — PHONE 50 (See Note ④)

Wide Area — Telecommunications —

Conterminous US

" " — Data — All Other

Total Wide Area Services (See Note ⑤)

Private Line — Telephone

" " — Teletypewriter

" " — DP® Digital Services

" " — Other Telegraph

" " — Multipurpose Wideband

" " — Program — Audio

" " — Program — Television

" " — Other Services

Local Private Services Interstate

Toll Private Line Services Interstate

Total Private Line (See Note ⑥)

Other Toll Svc. Revenues (See Note ⑦)

Rent Revenues — Long Lines

Other Miscellaneous Revenues — Long Lines

Interest Charged Construction

Associated Companies

Long Lines

Total

Less: Provision for Uncollectibles (See Note ⑧)

Total Interstate

SETTLEMENTS EXCEPT DIV. OF REVENUES

Made by Associated Companies

Made by Long Lines

Total

DIVISION OF REVENUES

Revenues

Expenses and Other Taxes

Associated Companies

Long Lines

Total

Federal Income Tax

Associated Companies

Long Lines

Total

Average Net Book Costs

Associated Companies

Long Lines

Total

% Long Lines of Total

Balance for Division

Associated Companies

Long Lines

Total

Adjustment of Prior Settlements

Associated Companies

Long Lines

Total Operating Revenues

Associated Companies (See Note ⑨)

TOTAL OPERATING REVENUES

LONG LINES (See Note ⑩)

DIVISION OF REVENUES

The twenty-three Bell System Associated Companies and the Long Lines Department are engaged, jointly, in furnishing interstate and overseas communications services under a uniform schedule of rates.

The plant costs and operating expenses, however, vary substantially among the respective Companies. To make it possible for the Companies to furnish interstate services at uniform rates and at the same time to recognize the differences in operating costs, the revenues must be divided on an equitable basis.

This is accomplished through an arrangement known as the "Division of Revenues", which may be visualized in partnership terms.

Each partner determines, monthly, the amount of plant it furnished, the applicable reserves, the amounts it paid to connecting carriers not in the partnership, and the expenses and taxes it incurred in the partnership enterprise.

The total revenues received from the customers are determined.

Each partner receives out of the revenues an amount for its expenses and taxes and the payments it makes to connecting carriers.

The remaining money is divided among the partners on the basis of the dollars of net plant each partner has furnished.

NOTES

(Applicable to page 103)

LONG DISTANCE INTERSTATE REVENUE DATA

- ① Prior to January 1964 the Associated Company portion of Interstate Telephone Message Revenue data reflects revenues after deductions for uncollectibles and miscellaneous items. 1982 includes Offshore revenue.
- ② Outside Conterminous United States. 1982 excludes Offshore revenue.
- ③ a. June 1959 to January 1964 the Associated Company portion of Interstate TWX data reflects revenues after deductions for uncollectibles and miscellaneous items.
b. Sold to Western Union, March 31, 1971.
- ④ a. Service began April 1969.
b. Service discontinued December 1979.
- ⑤ Services began January 1961.
- ⑥ a. June 1959 to January 1964 the Associated Company portion of Interstate Private Line data reflects revenues after deductions for uncollectibles and miscellaneous items.
b. Change in service January 1980.
- ⑦ Service began October 1977.
- ⑧ Prior to January 1964 data include Long Lines uncollectibles only.
- ⑨ Includes operating expenses and other taxes, Federal Income Tax, Share of Balance for Division, Adjustments of Prior Settlements, less Interest Charged Construction.

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LONG-DISTANCE INTERSTATE TELEPHONE MESSAGES^①

REVENUE FACTORS – BY CLASS OF CUSTOMER

Quarterly^②

(Charts on Pages 114 & 116)

PAID MINUTES

Year	Business					Residence					Public and Semi-Public					Total				
	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Year
1962	—	6.34	6.33	6.42	6.36	—	7.78	7.50	8.00	7.76	—	4.99	4.79	5.02	4.93	—	6.86	6.73	7.04	6.88
1963	6.50	6.42	6.33	6.39	6.41	8.08	8.03	7.71	8.25	8.02	5.08	4.98	4.90	5.08	5.01	7.12	7.05	6.85	7.17	7.05
1964	6.54	6.37	6.33	6.39	6.40	8.39	8.25	7.97	8.50	8.28	5.09	5.07	4.93	5.14	5.05	7.30	7.14	6.99	7.30	7.18
1965	6.49	6.37	6.34	6.41	6.40	8.62	8.50	8.22	8.80	8.54	5.28	5.16	5.01	5.29	5.18	7.42	7.30	7.14	7.49	7.34
1966	6.48	6.38	6.39	6.41	6.41	9.03	8.84	8.49	9.09	8.86	5.41	5.32	5.20	5.53	5.36	7.61	7.45	7.29	7.64	7.50
1967	6.47	6.36	6.32	6.38	6.38	9.11	9.09	8.65	9.28	9.03	5.47	5.43	5.23	5.57	5.42	7.66	7.58	7.36	7.74	7.58
1968	6.47	6.30	6.28	6.33	6.34	9.38	9.20	8.88	9.43	9.22	5.58	5.52	5.39	5.63	5.52	7.81	7.66	7.49	7.82	7.69
1969	6.41	6.31	6.29	6.37	6.34	9.52	9.37	9.03	9.67	9.40	5.59	5.53	5.35	5.69	5.53	7.86	7.74	7.58	7.97	7.79
1970	6.44	6.29	6.29	6.36	6.35	9.69	9.58	9.09	9.68	9.50	5.53	5.36	5.21	5.38	5.36	7.97	7.83	7.62	7.97	7.84
1971	6.40	6.26	6.04	6.12	6.20	9.69	9.53	9.04	9.65	9.47	5.23	5.14	5.01	5.33	5.17	7.93	7.81	7.50	7.90	7.79
1972	6.19	6.06	6.06	6.09	6.10	9.77	9.55	9.24	9.88	9.61	5.37	5.22	5.04	5.24	5.22	7.91	7.78	7.63	8.00	7.83
1973	6.15	6.03	6.05	6.08	6.08	9.94	9.68	9.44	10.03	9.77	5.13	5.04	4.93	5.05	5.04	7.95	7.81	7.72	8.04	7.88
1974	6.16	6.05	6.05	6.11	6.09	10.25	9.89	9.60	10.17	9.97	5.14	5.00	4.92	5.11	5.04	8.12	7.93	7.80	8.15	8.00
1975	6.17	6.02	6.00	6.07	6.06	10.10	9.86	9.65	10.25	9.96	5.04	5.01	5.02	5.30	5.09	8.09	7.94	7.87	8.26	8.04
1976	6.09	5.96	5.97	5.99	6.00	10.21	10.02	9.79	10.45	10.11	5.28	5.26	5.15	5.31	5.24	8.17	8.06	7.98	8.37	8.14
1977	6.03	5.85	5.85	5.88	5.90	10.50	10.22	9.97	10.66	10.34	5.31	5.32	5.07	5.36	5.26	8.34	8.14	8.04	8.48	8.25
1978	5.94	5.81	5.85	5.88	5.87	10.62	10.39	10.18	10.84	10.50	5.31	5.30	5.33	5.40	5.32	8.42	8.22	8.18	8.57	8.35
1979	5.91	5.85	5.85	5.89	5.87	10.82	10.66	10.40	11.04	10.73	5.48	5.48	5.33	5.73	5.51	8.49	8.41	8.37	8.70	8.49
1980	5.96	5.84	5.83	5.92	5.89	11.12	10.87	10.62	11.15	10.94	5.77	5.85	5.82	6.19	5.91	8.70	8.55	8.49	8.84	8.65
1981	5.92	5.80	5.80	5.91	5.86	11.14	10.87	10.43	11.06	10.88	5.63	5.47	5.18	5.45	5.43	8.74	8.57	8.39	8.83	8.63
1982	5.91	5.82	5.86	5.92	5.88	11.01	10.67	10.46	10.94	10.77	5.46	5.87	5.98	6.11	5.86	8.73	8.57	8.51	8.88	8.67

LENGTH OF HAUL

Year	Business					Residence					Public and Semi-Public					Total				
	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Year	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Year
1962	—	339	337	340	339	—	340	331	342	338	—	213	210	203	209	—	329	324	330	328
1963	357	355	351	354	354	346	373	368	381	368	230	229	237	232	232	343	354	349	358	351
1964	376	361	362	365	366	391	383	384	392	387	267	257	261	258	261	375	363	364	370	368
1965	378	373	371	383	376	404	409	409	416	410	277	276	279	286	280	383	384	382	393	386
1966	396	393	393	398	395	428	430	428	435	430	312	300	313	323	312	405	404	403	411	406
1967	413	403	403	411	407	443	444	439	452	445	330	321	319	335	326	422	417	414	426	420
1968	427	424	425	432	427	463	462	460	470	464	361	344	351	363	355	440	438	437	447	441
1969	452	448	450	456	451	477	475	474	478	476	373	368	365	376	370	460	457	456	463	459
1970	474	461	463	468	466	493	487	480	490	488	395	384	384	373	384	479	470	467	474	473
1971	479	483	459	469	473	502	493	481	491	492	382	371	354	378	372	486	483	466	477	478
1972	481	473	471	485	478	494	489	483	500	492	415	371	362	358	376	486	478	473	489	481
1973	500	492	489	502	496	503	497	489	505	498	382	359	359	362	365	498	490	485	499	493
1974	516	510	506	518	512	511	504	496	510	505	372	343	351	370	359	509	502	496	510	504
1975	527	518	517	523	521	516	513	511	529	517	389	375	384	384	383	518	513	511	524	516
1976	533	524	525	532	529	535	532	525	547	535	405	413	398	422	409	532	527	523	539	530
1977	543	533	531	542	537	555	546	540	560	550	434	409	410	424	419	548	538	534	551	543
1978	557	546	544	556	551	571	563	563	583	570	435	411	423	403	418	563	554	553	570	560
1979	568	560	562	571	565	591	583	581	596	588	436	428	447	524	459	579	571	571	584	576
1980	582	578	573	581	579	606	596	583	601	597	464	435	466	473	460	594	587	577	591	587
1981	590	578	572	577	574	610	597	585	603	599	466	440	428	434	442	600	587	578	591	589
1982	586	570	564	566	571	611	596	585	600	598	438	540	531	537	511	599	585	576	586	587

^① Includes only Conterminous U.S. traffic.^② Based on the Message Analysis Sampling Plan through Second Quarter 1971 and the Centralized Message Data System effective Third Quarter 1971.

MAJOR RATE CHANGES

MESSAGE TELETYPEWRITER EXCHANGE SERVICE

- Jul. 15, 1933 Initial Period changed from 5 to 3 minutes.
- Mar. 1, 1944 Reduction in Additional Minute Rates from about 1/3 of Initial Period Rates to 1/4 of such rates, applicable where Initial Period Rate is 45¢ or more.
- Feb. 1, 1946 Reduction in rates for service beyond 350 miles.
- Jul. 1, 1953 Rates increased for most hauls up to 2,300 miles; Fixed Monthly Charge of \$10.00 introduced and \$10.00 Monthly Guarantee eliminated; Report Charges discontinued.
- Sep. 1, 1966 Initial Period changed from 3 to 1 minute and Initial Period Rates reduced. Additional 15¢ charge established for each collect call. Fixed Interstate Monthly Charge of \$10.00 eliminated. Basic Monthly Service Charge established, \$40.00 for 60 speed and \$45 for 100 speed. Station Equipment and Miscellaneous Items filed in the Interstate Tariff.
- Feb. 1, 1970 Rates increased for both Station Equipment and Messages over 400 miles.
- Mar. 31, 1971 Services sold to Western Union.
TWX was a Bell System offering from November 21, 1931 to March 31, 1971.

PRIVATE LINE SERVICES AND CHANNELS

- Mar. 20, 1933 Radio Transmission Schedule Modified resulting in reduction in charges.
- Jan. 1, 1934 Rates reduced for Telephone, Teletypewriter and Morse Services and Channels.
- Nov. 1, 1936 Rates reduced for Radio Transmission Channels.
- Sep. 16, 1939 Rates reduced for Telephone, Teletypewriter and Morse Services and Channels.
- Jul. 10, 1941 Rates reduced for Radio Transmission Channels.
- Aug. 16, 1941 Rates reduced for Teletypewriter and Morse Services and Channels.
- Feb. 1, 1943 Rates reduced for all Services and Channels except Telephotograph Channels.
- Jun. 1, 1943 Rates reduced for Telephotograph Channels.
- Feb. 1, 1946 Rates reduced for all Services and Channels except Radio Transmission Channels.
- May 1, 1948 Rates for monochrome Video channels were established.
- Jan. 21, 1951 Rates for Color Video channels were established.
- Jul. 1, 1953 Rates increased for Teletypewriter Equipment and adjusted for Teletypewriter and Morse Interexchange Channels.
- Aug. 24, 1958 Rates reduced for Telephone Services and Channels, for Telephotograph Channels and for Telephone Grade Miscellaneous Signaling and Data Channels.
- Dec. 2, 1958 Rates increased for Teletypewriter and Morse Services and Channels and for Teletypewriter Grade Miscellaneous Signaling and Data Channels.
- Jan. 16, 1961 Telepak tariff filed.
- Dec. 7, 1961 Rates for Educational Television (ETV) Systems were established.
- Oct. 1, 1964 Rates for Telephone Services and Voice-grade Channels reduced. Rates for Telephotograph Channels increased. Rates for Teletypewriter Station Equipment increased.
Rates to press customers not increased which created separate press rates.
- Aug. 1, 1967 TELPAKS A and B discontinued.
8000 Series Channels introduced.

MAJOR RATE CHANGES

PRIVATE LINE SERVICES AND CHANNELS (continued)

- Sep. 1, 1968 Rates for TELPAKS C and D increased.
- Nov. 1, 1968 Rates for Teletypewriter Station Equipment increased.
- Oct. 2, 1969 Rates for Television Service (combined Video and Audio transmission) were established.
- Feb. 1, 1970 Rates for TELPAKS C and D increased.
- Apr. 4, 1971 Rates to Hawaii reduced.
- Jul. 1, 1971 Special press rates discontinued.
- Jul. 1, 1971 Rates for Television Service for the Corporation for Public Broadcasting's (CPB) PBS Television Network were established.
- Aug. 20, 1971 Rates to Hawaii reduced.
- Aug. 25, 1971 Rates to Europe reduced.
- ~~May 4, 1972 Monthly and installation charges for Private Line Service Terminals and installation charges for CCSA and SCAN increased.~~
- Jul. 3, 1972 Reduction in monthly charge for 201 Data Sets — Private Line service.
- Jul. 1, 1973 Tariff revisions for Series 7000 local channels, Type 7001 interexchange channels and station connections provided for full time television rates offered on a 24 hour daily basis, per month.
- Jul. 30, 1973 Rates reduced for Series 2000, 3000, 4000, and Type 8800 channels between San Francisco, California and Honolulu, Hawaii.
- Mar. 25, 1974 209 Data Set offering 9600 bit per second data transmission on a voice grade private line service introduced.
- Jun. 13, 1974 Hi-Lo tariff revisions became effective. Modified the general rate structure for Series 2000 and 3000 services, provided separate rate levels for High-Density and Low-Density channels.
- Sep. 23, 1974 DATASPEED 40 Data Communications Equipment operating at line speeds of 1050 and 1200 words per minute on private line service introduced.
- Dec. 15, 1974 DATAPHONE Digital Service between Boston, Chicago, New York, Philadelphia and Washington introduced.
- Mar. 9, 1975 Private Line rates for Series 1000, 2000, 3000, 4000, 5000, 6000, 8000 and 10,000 channel were increased by 5.1%
- Oct. 9, 1975 Rates increased for Private Line Series 2000/3000 IXC short haul, channel terminals and station terminals.
- Feb. 29, 1976 Private Line rates for Series 2000, 3000, 4000, 5000, 6000, 8000, 10,000 channel and rates for DATAPHONE Digital Service were increased 3%.
- Mar. 23, 1976 Rates for Series 1000 Interexchange Channels were increased for all elements of the service.
- Aug. 20, 1976 Multi-Schedule Private Line tariff became effective. Modified the rate structure for series 2000 and 3000 services, providing three schedules of interexchange channel rates.
- Dec. 18, 1976 EPSCS tariff became effective.
- Mar. 24, 1977 Dataphone Digital Service speeds 2.4, 4.8, 9.6 and 56 Kbps rates were increased 20% in compliance with the Commission's final decision on Docket 20288.
- Oct. 13, 1977 Increase all rates for Series 6000 Channels by 5% across the board.

(continued on next page)

MAJOR RATE CHANGES

PRIVATE LINE SERVICES AND CHANNELS (continued)

- Oct. 28, 1977 Increase all rates approximately 20% for Switched Circuit Automatic Network (SCAN)
Increase all rates for telegraph station equipment.
- Jun. 6, 1978 Rates and regulations for the 43 Teleprinter were established.
- Oct. 12, 1978 Increase all SCAN rate elements by 35%.
- Dec. 1, 1978 Rates reduced for Private Line Voicegrade Channels Series 2000 and 3000 between San Francisco and Honolulu, Hawaii.
- Jun. 2, 1979 Increase all CCSA rates elements by 29%.
- Apr. 1, 1980 Rates for television service for the Corporation for Public Broadcasting's (CPB) PBS television network were discontinued.
- Apr. 11, 1980 DATAPHONE[®] II data sets and diagnostic equipment were introduced.
- Jun. 6, 1980 Increase Private Line rates by 5.12% across-the-board.
- Dec. 10, 1980 Rates for audio service for the Corporation for Public Broadcasting's (CPB) NPR radio network were discontinued.
- May 5, 1981 Demise of TELPAK Service.
- May 19, 1981 Increase Private Line rates across-the-board to raise earnings ratio for Private Line to the authorized rate of return (10.5%).
- Jun. 28, 1981 Under the General Rate Increase Private Line rates were increased a uniform 16% to achieve the new authorized rate of return for interstate (12.75%).
- Sep. 25, 1981 Rates became effective for an unbundled Satellite Television Service (STS) offering.
- Feb. 17, 1982 Decrease in rates from U.S. East Coast Gateway Cities to points in the Caribbean Region for Series 2000 and 4002 International Private Line Services.
- Apr. 2, 1982 Rate increase of 1.6% due to equalization of earnings ratios in the Private Line Category.
- Apr. 10, 1982 Rates became effective for 1.5 Megabit per second Satellite Service.
- Apr. 25, 1982 Rates became effective for the first AT&T domestic satellite audio distribution service.
- Jun. 15, 1982 Tariff revisions to permit the connection of DATAPHONE Digital Service for Trans Canada's Dataroute.
- Jul. 2, 1982 Rates became effective for High Speed Switched Digital Service (HSSDS), formerly referred to as Video Teleconferencing Service (VTS).
- Nov. 7, 1982 Rates became effective for a temporary offering of Pre-emptible Transponder Channels/Facilities (PTC's/PTF's) to be established on AT&T's domestic satellite system using transponders on the system protection satellite.

WIDE AREA TELECOMMUNICATIONS SERVICE

- Jan. 15, 1961 Outward WATS became a service offering.
- Jan. 1, 1967 Inward WATS became a service offering. Measured time minimum period reduced from 15 hours to 10 hours, and overtime rates reduced for measured time.
- Nov. 1, 1967 Measured time rates reduced.
- Feb. 1, 1970 Measured and full-time rates reduced.
- Mar. 14, 1973 Interstate WATS rate increase of 2% across the board.

PART I - FINANCE (Cont'd.)

• Total IM-DP Expense to Total Operating Expenses and Taxes

Total IM-DP Expense - Total IM Departmental Expenses (Account 670X) taken from the MOR "Operating Expenses - General Office, Other and Depreciation" page, Form C1209; plus Total Data Processing Expenses (Data Processing Clearing Accounts 994X) taken from the MOR "Analysis of Clearing Accounts" page. These two amounts on a monthly basis should tie to the totals submitted on the Quarterly IMOR Financials in Sections A and B.

Total Operating Expense and Taxes - Derived from the MOR, Income Statement page, Form C1203. Normally, this amount is Line 21 in the current month actual column.

• Total IM-DP Expense to Total Operating Revenue

Total IM-DP Expense - Total IM Departmental Expenses (Account 670X) taken from the MOR "Operating Expenses - General Office, Other and Depreciation" page, Form C1209; plus Total Data Processing Expenses (Data Processing Clearing Accounts 994X) taken from the MOR "Analysis of Clearing Accounts" page. These two amounts on a monthly basis should tie to the totals submitted on the Quarterly IMOR Financials in Sections A and B.

Total Operating Revenues - Derived from the MOR, Income Statement page, Form C1203. Normally, this amount is Line 6 in the current month actual column.

IV. FUNCTIONAL AREA DEFINITIONS (Primary Source: 1982 Assimilation Guidelines)

• Operations Management

- General Management and dedicated secretarial support
- Data Control (job staging, log room)
- Data Scheduling (service desk, performance monitoring)
- Data Distribution (bill mailing, bursting/decollating, COM distribution, P/R check distribution)
- Computer Operations (RJE and Mini Center Operations)
- Data Entry (centralized and distributed)
- Other (Other cost causing activities that are not listed above)

• Planning

- General Management and dedicated secretarial support
- Strategic Planning (Business System Consulting Services)
- Capacity Planning
- Research and Development
- Major Project Administration
- Council Liaison
- Other (Other cost causing activities that are not listed above)

PART I - FINANCE (Cont'd.)

FUNCTIONAL AREA DEFINITIONS (Cont'd.)

- Information Resource Management
 - General Management and dedicated secretarial support
 - Data Resource Planning
 - Data Administration
 - Data Base Administration
 - Other (Other cost causing activities that are not listed above)
- Systems Management
 - General Management and dedicated secretarial support
 - Project Administration (DPSR/PAR evaluation, prioritization, scheduling of resources)
 - Requirements Definition
 - Systems or Modifications Design
 - Program Development and Testing
 - Product Certification (Test Company Simulation, Evaluation, User Training)
 - Tables Maintenance (centrally maintained)
 - Operations Support (operations problem resolution, JCL modifications, data set placement, operational enhancements)
 - Documentation support (Technical Library, text processors)
 - Inquiry Support (ASI-ST use by Systems Staff)
 - Technical Support (optimization, support utilities, data base and telecommunications control systems for standard applications)
 - Other (Other cost causing activities that are not listed above)
- Internal Services
 - Telecommunications (network architecture planning and design, device evaluations, protocol and integrity requirement definition)
 - Office Systems (technology evaluation and installation, user requirements definition and resolution, management of Office System resources)
 - Information Center Support (technology evaluation and installation, user consultation and training support of Decision Support Systems, including Time Sharing support)

PART I - FINANCE (Cont'd.)

FUNCTIONAL AREA DEFINITIONS (Cont'd.)

● Internal Services (Cont'd.)

Other Expenses for general management and secretarial support as well as other functions that report into this section to include the management of:

- (1) Hardware Evaluation (technology evaluations for vendor selection);
- (2) System Software (evaluation, installation and maintenance of operating software on applications operated by business unit);
- (3) Performance Monitoring (workload performance, configuration sizing, error handling, data base recovery analysis, tuning and response measurement for hardware applications)

● Administration

- General Management includes IM Exec's expenses and dedicated secretarial support
- Data Protection
- Contract Management
- Invoice, Budget and DPCA Administration
- Quality Assurance/Performance Measurement Reporting
- IM Training and Scheduling
- Personnel Administration
- Staff Services (centralized secretarial services or supplies acquisition services for other functional areas)
- Other (Other cost causing activities that are not listed above)

INPUT

PARK 80 PLAZA WEST-1, SADDLE BROOK, NEW JERSEY 07662

(201) 368-9471

Ms. Donna Harris
Manager, Best
GTE Data Services
P.O. Box 1548
Tampa, FL 33601

February 7, 1984
cc: Dave Salyer

Dear Ms. Harris

This will confirm our conversation of yesterday regarding the discovery and assessment of detail data regarding Bell System expenditures and a brief preliminary project to obtain and, if required, analyze that data. Specifically, we understand the following:

- 1) GTE Data Services is interested in obtaining for competitive analysis public but not normally published data on AT&T and Bell operating expenses.
- 2) Through its research efforts INPUT has found such data of a detailed nature within the hierarchy of the FCC. Such data is available for inspection and copying only at the FCC in Washington D.C.
- 3) As a consequence, you have retained INPUT to travel to Washington, meet with appropriate Commission personnel, view the data and make a preliminary assessment of its utility and obtain copies.
- 4) INPUT will preliminarily analyze the available accounting data, assess its utility in present and future uses and report to you the results of that analysis.
- 5) The fee for these services will be on a time & material basis and will not exceed \$5,000. Expenses for travel to Washington will be incremental. Depending upon the amount and complexity of the data available, the fee may be less.

It is our understanding that we have your authorization to proceed along the above lines. We will be reporting shortly on our initial findings. Thank you for thinking of INPUT.

Sincerely,



Don Fostle
Principal Consultant

INPUT

PARK 80 PLAZA WEST-1, SADDLE BROOK, NEW JERSEY 07662

(201) 368-9471

Ms. Donna Harris
Manager, Best
GTE Data Services
P.O. Box 1548
Tampa, FL 33601

February 7, 1984
cc: Dave Salyer

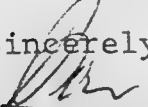
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Sincerely,


Don Fostle
Principal Consultant



**GTE Data Services
Incorporated**

First Florida Tower
P. O. Box 1548
Tampa, Florida 33601
813 224-3131

January 10, 1984

Mr. D. W. Fostle
Principal Consultant
INPUT
Park 80 Plaza West-1
Saddlebrook, New Jersey 07662

Dear Don:

SUBJECT: FORM M Report
FILE NO.: I6

I have enclosed a copy of the FORM M Reports provided by the TELCOS to the FCC. Although the report is for 1980, the data elements reported have not changed.

I am looking forward to discussing this project further during our meeting on Tuesday, January 17, 1984.

Sincerely,

A handwritten signature in cursive script, appearing to read "D. C. Harris".

D. C. HARRIS
PROGRAM MANAGER-BEST

DCH/dmm
Enclosure



STANDARD PRODUCTS - NOT COVERED By Memo

NOVEMBER 1983 - YTD DPAS

→ INFO CENTER 143,707
OTHER 7,069,159
PRODUCT COSTING 19,102
→ RJETELCO ENTRY 1,422,269
SEP/SETTLEMENTS 10,882
TRUNK ADMINISTRATION 12,168

TOTAL 8,677,287

45%

TOTAL LOCAL 19,487,867 100%

20

STANDARD PRODUCT CRITERIA INDEX

<u>STANDARD PRODUCT NAME</u>	<u>PAGE</u>
* CBIS	10
* COMER	11
* CRB-OFF LINE SORCES	13
* CUSTOMER RECORDS & BILLING	14
* EMPLOYEE	15
* FINANCIAL	16
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RJE - PROCESSING	24
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* UNIVERSAL MEASURED SERVICE	31

STANDARD PRODUCT CRITERIA

The Data Processing Cost Allocation Committee was asked to determine appropriate criteria for Computer Services and to assure consistency in the application of that criteria. For the purpose of gaining a common understanding throughout this exhibit, the following terms have been clearly defined.

Utility program/system: Any program or system which has been defined for common use by multiple programs and/or systems. A limited example of such would be GET and ASSIST (designed as common data retrieval routines), SPURT (designed as a common report printing program), and many externally supplied software packages such as SORT and MERGE (both used to sequence data for processing).

Auxiliary program/system: Any program or system created locally to satisfy data requirements not currently satisfied by the BIS System as well as program interfaces that extract data from a system to feed other systems.

STANDARD PRODUCT NAME: CBIS

Computer Services for Customer Billing and Information System (CBIS) are centered around the BIS-CBIS programs. CBIS operates on an on line/off line basis with a data base. Systems associated with this Standard Product will include activities such as:

- (a) Cash Processing
- (b) Service Order Processing
- (c) Billing adjustments
- (d) Statistical reporting
- (e) Balancing and control reports
- (f) Systems for cash entry
- (g) Service Order Records on line
- (h) Adjustments and toll from the Toll System for processing through the Billing System
- (i) Facilities Assignment Information
- (j) Treatment.

This Standard Product includes associated auxiliary, or utility programs/systems.

STANDARD PRODUCT NAME: COMER

Computer Services for COMER (Central Office Mechanized Equipment Record) are centered around the BIS Programs for COMER. Also included are auxiliary or utility programs/systems associated with this Standard Product.

STANDARD PRODUCT NAME: CRB-OFF LINE SORCES

Computer Services for these Standard Products involve the operation of BIS-CRB R1V4 in conjunction with the off-line portion of SORCES R2V1.

Services performed by the various data processing systems classified to this Standard Product include:

- (a) Cash processing
- (b) Service Order processing
- (c) Billing adjustments
- (d) Statistical reporting
- (e) Balancing & control reports
- (f) Systems for cash entry
- (g) Service Order Records on line
- (h) Adjustments and toll from the Toll system for processing through the Billing System
- (i) Facilities Assignment Information

System costs for the off-line of SORCES R2V1 are included in this Standard Product and systems associated with it should be coded to it. This Standard Product includes associated auxiliary or utility programs/systems.

STANDARD PRODUCT NAME: CUSTOMER RECORDS & BILLING

Computer Services for Customer Records & Billing (CRB) are centered around the BIS-CRB RLV2 programs or any non-BIS Billing Systems that provide billing and/or treatment of customer accounts. Non-BIS systems would include billing activities such as:

- (a) Cash processing
- (b) Service Order processing
- (c) Billing adjustments
- (d) Statistical reporting
- (e) Balancing & control reports

Also included are associated auxiliary or utility programs/systems.

STANDARD PRODUCT NAME: EMPLOYEE

Computer Services for this Standard Product are centered around the creation and maintenance of payroll and personnel master file records, payroll and deduction amount calculation and check preparation, including related standard reports. These reports are designed to satisfy standard management, GTESE, or legal requirements. Typical data processing services classified to this Standard Product are:

- (a) Time (hours to be paid)
- (b) Labels, when run from the Employee System Files
- (c) Associated auxiliary or utility programs/systems
- (d) Generating HRIS updates

STANDARD PRODUCT NAME: FINANCIAL

Data processing services for this Standard Product are those provided by systems in non-BIS OPARS Companies. Generally, they include systems designed to perform the various accounting and budgeting functions. Typical data processing services classified to this Standard Product are:

- (a) Journal Processing
- (b) Ledgers
- (c) Accounts Payable
- (d) CORS
- (e) Work Order
- (f) Bank Account Reconciliations
- (g) Mortality Data
- (h) Automatic Electric (AE) Summary Billing Processing
- (i) Miscellaneous Billing
- (j) BIS - MADA
- (k) Level Runs
- (l) Budget Processing
- (m) Labor and Material Pricing
- (n) Inventories (M&S)
- (o) Cost Allocation Studies, i.e., house services, data entry
- (p) Historical Cost Analysis
- (q) Time (hours to be distributed) input interface when the time and labor input is segregated between the Financial System and the Employee System
- (r) Associated auxiliary or utility programs/systems
- (s) Universal data collection system

This Standard Product should not include Plant Measurement or Property Record Systems; such systems should be included in the Standard Product "OTHER".

STANDARD PRODUCT NAME: MATERIAL CONTROL

Computer Services for Material Control are centered around both BIS Material Management System and Materials Management Information Systems and all auxiliary programs/systems designed to supplement these systems.

Associated auxiliary or utility programs/systems are included in this Standard Product.

(a) TEPRS/AD 24

STANDARD PRODUCT NAME: ON LINE MSOS

Computer Services for this Standard Product are centered around the BIS MSOS System and provide business office inquiry and adjustments of customer accounts.

Functions performed by the BIS MSOS System include displaying customer accounts on CRT units, adjusting those accounts for improper charges, and preparing input records for the CRB System. It also includes the application of vouchers in all accounts, and prepares records and reports used by Centralized Toll Investigation (CTI) units, and Customer Name and Address (CNA) Bureaus.

This Standard Product should include systems associated only with MSOS and not systems associated with CRB and/or SORCES and other Standard Products.

Also included are associated auxiliary or utility programs/systems.

STANDARD PRODUCT NAME: ON LINE SORCES

Computer Services for this Standard Product are for the services provided by SORCES.

Services performed by the on line program classified to this Standard Product include:

- (a) Input service order entry
- (b) Service order inquiry by telephone number
- (c) Service record and line card inquiry
- (d) Pending order reference lists
- (e) Pending trouble inquiry
- (f) On line trouble reports
- (g) Service order treatment inquiry
- (h) Vacant address file

Any associated on line auxiliary or utility programs/systems should also be included.

STANDARD PRODUCT NAME: OPARS

Computer Services for OPARS are centered around both BIS - OPARS and various local auxiliary systems designed to supplement OPARS. Typical data processing services classified to this Standard Product are:

- (a) OPARS
 - (b) Associated auxiliary or utility programs/systems
- (c) CORS
 - (d) Miscellaneous Billing
 - (e) Accounts Payable
 - (f) Work Order
 - (g) Bank Account Reconciliations
 - (h) Mortality Data
 - (i) Automatic Electric (AE) Summary Billing Processing
- (j) BIS - MADA
 - (k) Cost Allocation Studies; i.e., house service, data entry
 - (l) Historical Cost Analysis
 - (m) Time (hours to be distributed) input interface when the time and labor input is segregated between the OPARS and Employee System.

This Standard Product should not include Plant Measurement or Property Record Systems; such systems should be included in the Standard Product "OTHER".

STANDARD PRODUCT NAME: OTHER

The "Other" Standard Product includes:

- (a) Miscellaneous processings and
- (b) Various BIS and local Systems whose computer utilization is not considered consequential enough to be classified as a separate Standard Product.

Typical data processing services classified to this Standard Product are:

- (a) CPR systems for land and buildings, central office equipment (other than COMER), large PBX, outside plant and the identified plant accounts.
- (b) Measurement systems of various types
- (c) Construction Budget (as opposed to the company budget which has been classified as part of the financial standard product)
- (d) Energy utilization systems reporting on vehicle usage
- (e) Marketing and Sales performance studies/systems
- (f) Traffic Studies (if the Standard Product "TDS" is being billed, systems related to Traffic Studies should be assigned to the Standard Product "TDS". In addition, if the system in question processes a predominance of Toll data, 51% or greater, as opposed to Traffic data, it should be assigned the Standard Product "Toll-BIS" or "Toll-Local".)

OTHER (Continued)

- (g) Labels not made from Employee/Masterfile
- (h) Any auxiliary or utility programs/systems associated with this Standard Product
- (i) Many BIS systems, like BIS - Peg Count System, that do not have a particular Standard Product devoted to them (see Exhibit IV for a complete list) or are included in another BIS System's Standard Product

STANDARD PRODUCT NAME: PRODUCT COSTING

Computer Services for Product Costing are centered around the UDCS/ SERVPRO, SPARS, and various auxiliary systems. The use of the Universal Data Collection System (UDCS) comprehensive front-end tables is for the purpose of accumulating interfaced data from various BIS systems, local systems or manual inputs to be edited/balanced before passing on to BIS SERVPRO. BIS SERVPRO established a common data framework, component codes, for accumulating product data into four files:

Investments

Revenues

Expenses

Other

The data residing in these files is to be formatted for ready access (data extract) from multi-users. Defined applications to date include Embedded Direct Cost Studies and Business Segment Financial Statements.

The Service Product Activity Reporting System uses interfaced data from OPARS (or a local financial accounting system) CRB and BIS Trouble systems in order to match labor hours reported on time documents to related service orders or trouble reports.

This Standard Product should also include standard BIS programs which would be scheduled for use in replacing the RCS Time Share programs currently employed to provide product cost data within defined SERVPRO modules.

Also included in this Standard Product would be BIS Programs and/or associated auxiliary or utility programs/systems for product costing data extracts/applications from SERVPRO files.

STANDARD PRODUCT NAME: RJE-PROCESSING

RJE (Remote Job Entry) is a data processing approach which permits users at a remote location to submit and receive data (jobs) in much the same manner as at the central computer location. Input and output devices such as the card reader and printer are connected to the central computer by communications lines. Data is entered at the local site card reader and submitted for processing. When some input arrives from the remote terminal, the operation system (the central computer) "initiates a job", which then processes the data. Once the job has been completed, the output is transmitted to the remote site printer, unless the central installation high-speed printer is specified.

STANDARD PRODUCT NAME: SEPARATIONS/SETTLEMENTS

Computer Services for this Standard Product are for the operation of the BIS - Separations/Settlements System. Services classified to this Standard Product include:

- (a) Edits and running of the Separations/Settlements System
- (b) Associated auxiliary or utility programs/systems
- (c) OPTICS II and OPTICS III

STANDARD PRODUCT NAME: TOLL-BIS

Computer Services for this Standard Product are for the processing of toll and local messages through the BIS Toll System. Services classified to this Standard Product include:

- (a) Systems for TSPS, ETS-4, No. 1 EAX, PL-1 and PL-2 or any other system that will be similarly associated with Toll
- (b) Associated auxiliary or utility programs/systems

STANDARD PRODUCT NAME: TOLL-LOCAL

Computer Services for TOLL-LOCAL are for programs used for processing toll and local messages, when the BIS-TOLL System is not used. Services classified to this Standard Product include:

- (a) Systems for loading operator or mechanically recorded toll
- (b) Processing toll through Rating
- (c) Handling of Outcollects, Study Detail, Settlement Detail and errors
- (d) Processing toll through Billing
- (e) Associated auxiliary or utility programs/systems

STANDARD PRODUCT NAME: TRAFFIC DATA SYSTEM

Computer Services for the Traffic Data System are centered around a batch processing system which converts usage and event data, collected by a traffic measuring device or mini-computer, into Traffic Reports.

Included in this category are the standard BIS Programs for the Traffic Data System (and future releases/versions) as well as any associated auxiliary or utility programs/systems. If the Standard Product "TDS" is not being billed (BIS TDS not installed), systems related to Traffic Studies should be assigned to the Standard Product "Other". In addition, if the system in question processes a predominance of Toll data (51% or greater), as opposed to Traffic data, it should be assigned the Standard Product "Toll-BIS" or "Toll-Local".

STANDARD PRODUCT NAME: TROUBLE

Computer Services for Trouble are centered around analysis of customer trouble history for telephone company management. Using data collected for each corrected customer service problem, the computer-based system produces management reports showing a complete statistical profile of the type of trouble (and its location) on a daily, weekly and/or monthly basis.

Included in this Standard Product category are the standard BIS Programs for trouble (and future releases), associated auxiliary or utility programs/systems.

STANDARD PRODUCT NAME: TRUNK ADMINISTRATION

Computer Services for Trunk Administration encompass the mechanized establishment and maintenance of all circuits, equipment and facilities records associated with trunk plant.

Included in this Standard Product category are the standard BIS programs for trunk administration (and future releases/versions), and associated auxiliary or utility programs/systems.

STANDARD PRODUCT NAME: UNIVERSAL MEASURED SERVICE

(Definition pending from CALC Committee to be provided in Issue 2.)

Gasser & Son - Precision Mach. Co.
Carmel, NY 516-543-6600

Jay W. Treitle - Heat Exchangers - Syracuse
Carmel, NY 11530 516)832-8711

VIVISON 10/10 - 116 PARKSIDE DRIVE
Carmel, NY 11530 516)832-8711

Anatole Henschel - 116 PARKSIDE DRIVE
Carmel, NY 11530 516)832-8711

ISC - 116 PARKSIDE DRIVE
Carmel, NY 11530 516)832-8711

FLIPPER CLAMPS - 116 PARKSIDE DRIVE
Carmel, NY 11530 516)832-8711

JACKER INSTRUMENTS - 116 PARKSIDE DRIVE
Carmel, NY 11530 516)832-8711

Digital Scale/Weigher - 116 PARKSIDE DRIVE
Carmel, NY 11530 516)832-8711

Polychem - Marine Coatings - 116 PARKSIDE DRIVE
Carmel, NY 11530 516)832-8711

YTI, INC - Princeton, NJ. Marine EPOXY, Polyurethane -
Finite Element Analysis (609) 813-0000

E.V. Roback Big Distrib. - Shell & Penn. Emerson &
Common SUPER HEATSHRINKABLE TUBING

WATER IN TANK

WATER OUT "

SIL TANK "

WATER TANK

WATER TANK

WATER TANK

WATER TANK

WATER TANK



Bottom Elyse "K"

4 1/2 copies 1/10"

3400 lbs hull

100 day

641

18

570

TRIAL WT

L-CHUS

May 5, 1965

WALSH HOB

MAY 20, 1965

WATER TANK

WATER TANK

Stemora Island 1965 M.E.

Fiske University Fusion Reactor

Atmosphere info.

Synthetic plasma - FALIPROTECTIONS

MINT SOURCES - LOW RISK
RANK ORDER

	SOURCE	RATING
1)	INHOUSE SYSTEMS GROUP	3.80
2)	INHOUSE DP GROUP	3.64
3)	HARDWARE VENDOR	3.29
4)	SWITCH VENDOR	3.29
5)	MANUFACTURER	3.0
6)	TELECOM GROUP	2.71
7)	REGIONAL OPERATING CO.	2.46
8)	SPECIALIST FIRM	2.43
9)	SOFTWARE VENDOR	2.07
10)	ARTIST	1.93
11)	INHOUSE DEPT. 1000	1.57

AS SHOWN BY THE LOW INDEPENDENT TELCO RATING GTE WILL HAVE TO FIGHT FOR SHARE OF MIND. AT PRESENT THE PERCEPTION AMONG BELL COS. IS THAT THEY ARE THE MAINSTAY AND INDEPENDENTS HAVE NOTHING TO FEAR.

EXPOSURE TO THE GTE'S OFFERING MAY ALTER THIS BELIEF BUT AN INITIAL CREDIBILITY HURDLE MAY BE OVERCOME.

WHILE INVESTORS DO NOT HAVE LEAD IN MIND TO INVOLVE IN FINANCING, THEY ARE CAUTIOUS NOT TO BE AN INVESTMENT SOURCE. THIS ~~LEAD~~ LISTING MIGHT CLEAR THAT THEY WILL HAVE TO BE "SOLD" OR REFINANCED.

KEY HIGH POINTS IN MINTING VENDOR (IBM?) AND SWITCH VENDOR (WESTERN?) TO BE THE "OUTSIDE" COMPETITION WHICH HAS ESTABLISHED INSIDE LOCALITY. DISNEY.



- OTHER BOC'S, BCR AND THE REVOLVING COMPANY ARE IN A VERY DIFFICULT POSITION. THE POSITION IS NOT VERY GOOD. THE BOC'S ARE IN A VERY DIFFICULT POSITION. THE BOC'S ARE IN A VERY DIFFICULT POSITION.

THE POSITION IS NOT VERY GOOD. THE POSITION IS NOT VERY GOOD. THE POSITION IS NOT VERY GOOD.

- THE LOW POSITION OF THE INDY TELCO AT A SOURCE MEANS GTE'S WILL TAKE STEPS TO LET THEM KNOW OF THEIR OFFERING IN AN ACTIVE MANNER. GTE WILL NOT SEEK OUT GTE AT ALL. THE INDY GTE MUST GO TO THEM.

- "SHARE OF MIND" AND OVERCOMING TRADITIONAL RESISTANCE ARE THE KEY FACTS TO SUCCEED. THE FACTS ARE THAT THE INDY GTE MUST GO TO THEM.



PRIMARY SOC WITH F 11/1/95.

- o LMS IS GROWING VERY RAPIDLY IN TOTAL CONSUMPTION.
ANALYSIS OF THE DATA IS 27.9%/YR.
- o AN INCREMENTAL \$15.9-18 MILLION LINES
WILL BE REQUIRED TO MEET THE DEMAND FOR THE NEXT
FIVE YEARS.
- o RESISTANCE LMS LINE - SOME OF THE BUREAUS ARE
NOT READY TO ACCEPT IT.
- o POTENTIAL EXPENDITURES (BASED ON PRELIMINARY STUDY)
COULD EXCEED \$700 MILLION THROUGH 1967.
- o LMS IS OF GREAT STRATEGIC SIGNIFICANCE TO
BCC'S. IT WILL PERSIST IN SIGNIFICANCE.
- o PROGRAMS TOWARDS IMPROVING THE RECEIVING CAPACITY
APPROXIMATELY 10% PER YEAR. BUT BCC'S HAVE
TO BE AWARE OF THE COST OF IMPLEMENTATION.
- o THE FEATURES OF THE GTEDS LMS SYSTEM
ARE WELL-RECEIVED BY THE BCC'S.
- o HURDLES WILL HAVE TO BE OVERCOME IN THE RECEPTION
OF "INDEPENDENT BCC'S" THE "DO IT MYSELF" SYNDROME
AND THE MULTI-DEPARTMENTAL COORDINATION ASPECTS.
- o REPORT CONCLUDES THAT THE PROJECT IS REAL,
FEASIBLE AND THAT GTEDS LMS FITS
PRESENT NEEDS.
- o CONCLUSION: THE PROJECT IS FEASIBLE AND
WORTHY OF SUPPORT.

1864

As to the position of R.R.
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104 -

reference to

- Part of the following is from the same source

as the following is from the same source

10. The following is from the same source

11. The following is from the same source. There will be further problems

12. The following is from the same source

13. The following is from the same source

14. The following is from the same source

15. The following is from the same source

16. The following is from the same source

17. The following is from the same source

18. Just for the record, it has been found

that the following is from the same source

as the following is from the same source

19. VERY NEARLY BUT NOT IDENTICAL TO THE FOLLOWING, EACH PAGES

100

20. The following is from the same source

21. The following is from the same source

CANADIAN MARKET

0 11 FIRMS INTERVIEWED:

(3) B.C. TELEPHONE

(1) EDMONTON TEL.

(1) NEW FOUNDLAND TEL.

(1) AIRRITIME TEL.

(1) MANITOBA TEL

(1) ISLAND TEL.

(1) SASKATCHEWAN TEL.

(1) NEW BRUNSWICK TEL.

(1) S.E. TEL.

(2) P.E.I. TEL.

(1) ATLANTIC TEL.

0 AMONG THESE FIRMS THERE IS A TENDENCY TO
RESISTING LMS AT PRESENT WITH NO
MUCH

0 MARKET POTENTIAL FOR RESIDENTIAL LMS AMONG
THESE COMPANIES FOUND TO BE 16,000 LINES BY
1987, ALL IN ONE COMPANY. (N.T.B.C. TEL)

0 MARKET POTENTIAL FOR BUSINESS LMS IS LESS THAN
150,000 LINES BY 1987, AN INCREASE OF 4.7%
PER YEAR OVER PRESENT VALUE OF 130,000 LINES.

0 IT IS CLEAR THAT LMS HAS NOT YET EMERGED AS A
BILLING METHOD AMONG THESE CANADIAN RESIDENTS.

BALTIMORE 1,528,116
 CHICAGO 2,757,128
 CINCINNATI 1,491,064
 DALLAS 1,502,190
 MIAMI 1,245,110
 MINNEAPOLIS 1,497,467
 NEW YORK 5,751,000
 PHOENIX 1,710,113
 PHOENIX 1,337,573
 LOS ANGELES \rightarrow ~~1,091,787~~
 LOS ANGELES \rightarrow 1,988,561

BASE RATES		
	CONNECT L/R	C. M/R
✓ TYMNET (<1201)	\$4.25	\$0.05 k char
✓ TELENET (<1201)	\$3.90	\$1.70 k char
UNINET (<301)	\$2.25	\$1.0375 k char
ADP (<301)	\$3.00	\$1.03 k char
✓ COMPUSERVE (<1201)	3.75	1.04 k char
NET 1201	\$4.20	1.04 k char

COMPUSERVE - 416% connect \$2.025/HR \$8100/MONTH
 - 43.75% \$0.0225 5625/MONTH
 \$13,725 MONTH

TYPE 30 - V-12

130x170 27 liter -1650

5.8 620 HP 610 -
 \$5000 \oplus Carburetors

245 gram / HP

1733 RPM -

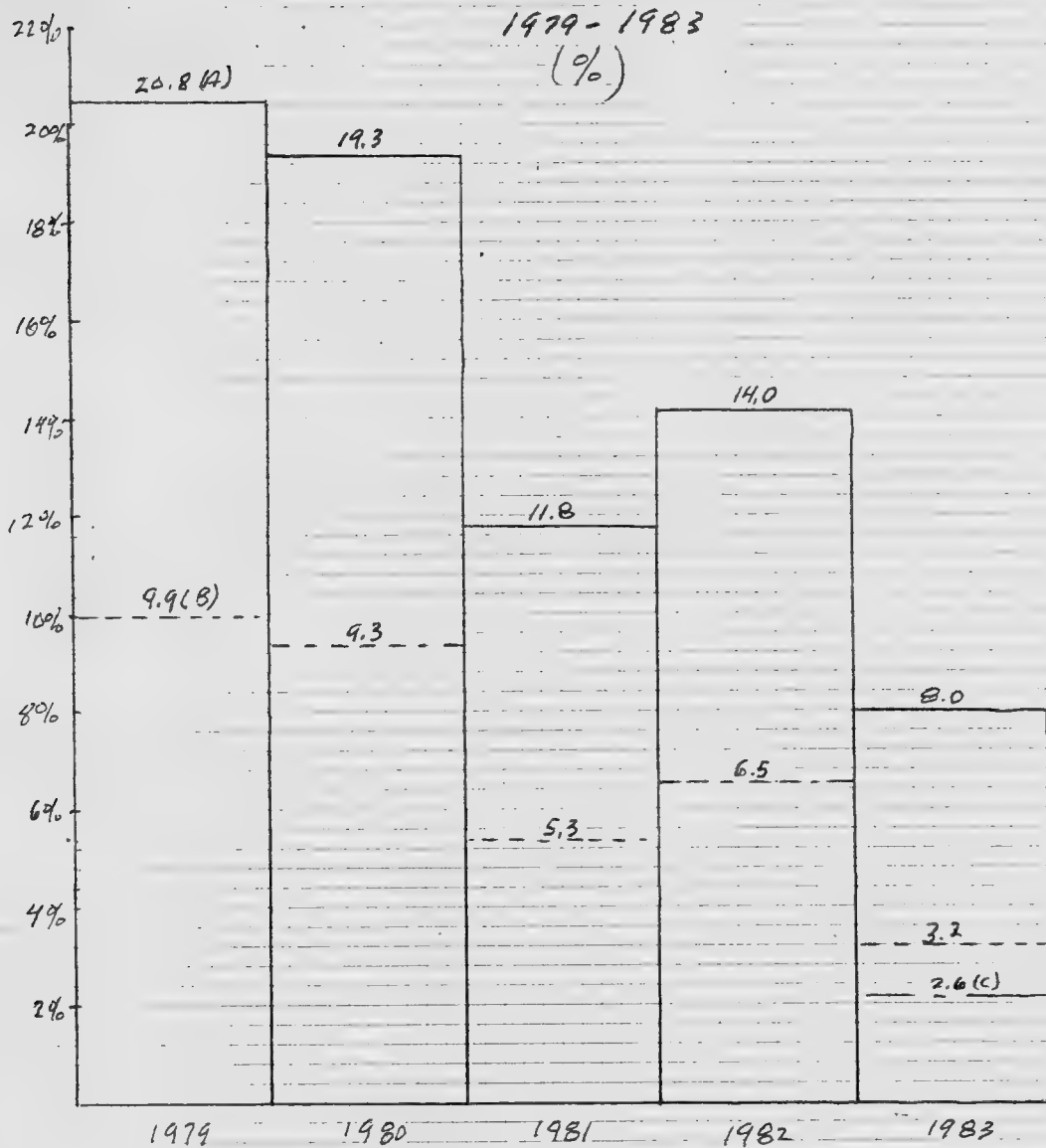
8 gram HP

1578 MM

726

904

TYMNET MARGINS ON A REPORTED
AND TAX-ADJUSTED BASIS



NOTES: (A) OPERATING PROFIT AS REPORTED AS A PROPORTION OF
NON-AFFILIATED REVENUE.

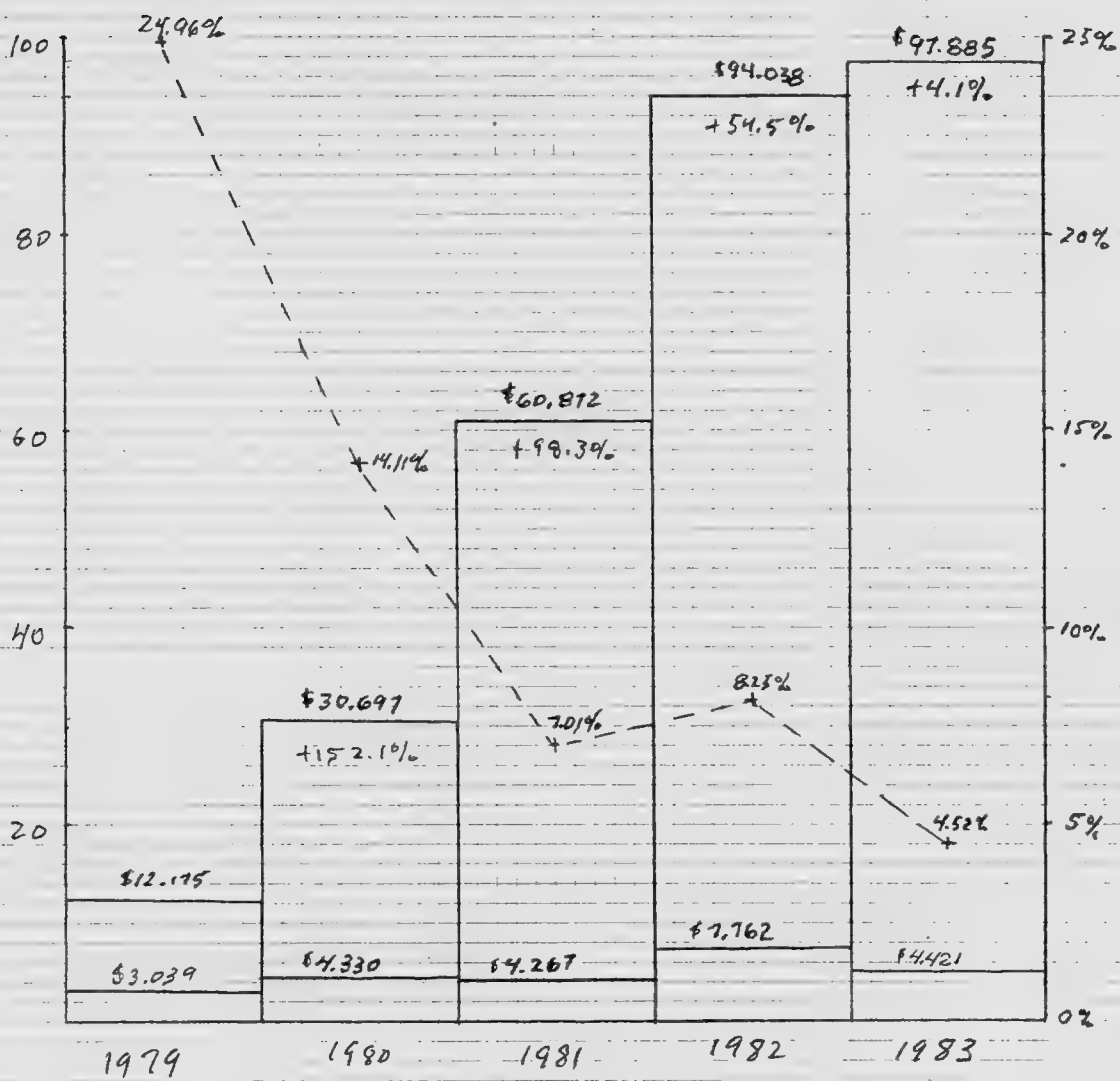
(B) OPERATING PROFIT NET OF PRO-RATA CORPORATE
ALLOCATION AND ADJUSTED TO 47% (FULL) TAX RATE
AS A PROPORTION OF NON-AFFILIATED REVENUE

(C) SAME AS (B) EXCEPT AS A PROPORTION OF NAFC
PLUS AFFILIATED REVENUE

**TYMNET IDENTIFIABLE ASSETS
AND PRETAX RETURN ON ASSETS**

1979-1983

(\$1,000,000)



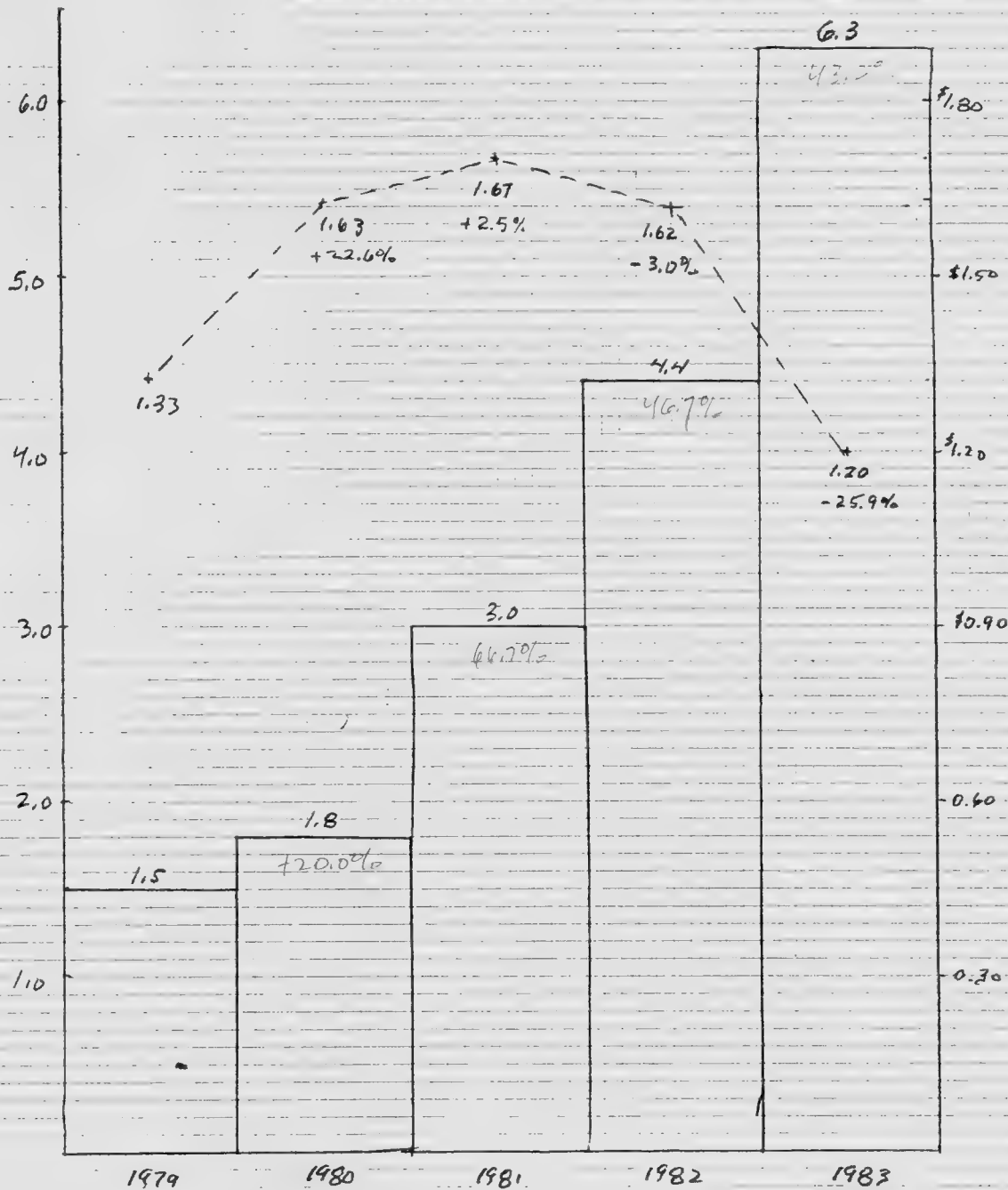
NOTE: PRE-TAX RETURN CONSISTS OF OPERATING PROFIT LESS A PRO-RATA PORTION OF CORPORATE EXPENSES. PRO-RATION PERFORMED ON A SHARE OF REVENUE BASIS.



TYMNET SESSIONS PER MONTH

(1,000,000)

JUNE 1979-1983



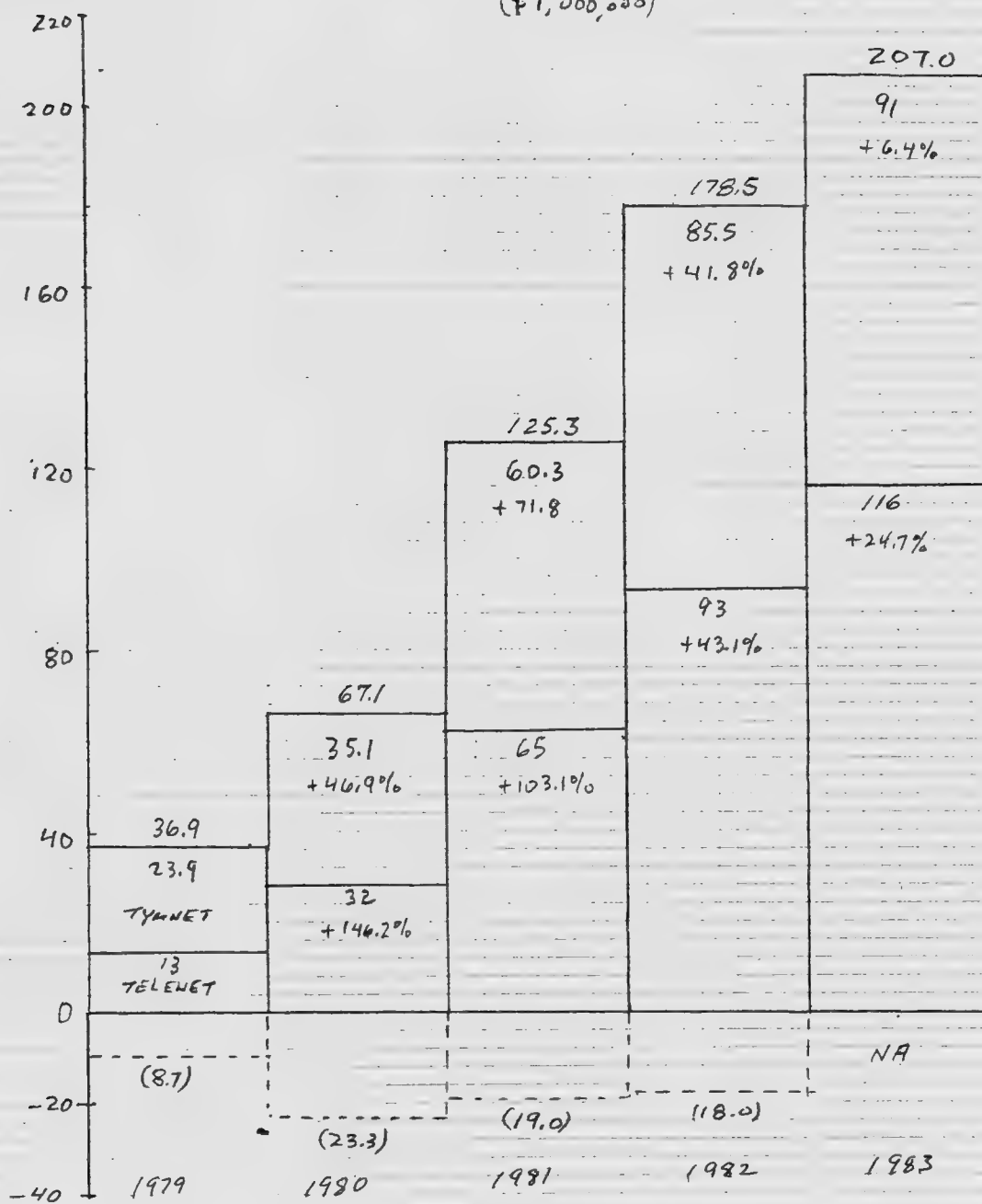
NOTE: DOTTED LINE REPRESENTS JUNE SESSIONS ANNUALIZED AND DIVIDED BY TOTAL REVENUES. THIS IS A PROXY FOR REVENUES PER SESSION.



COMBINED TYMNET & TELENET REVENUES & EARNINGS

1979-1983

(\\$1,000,000)



OVERALL GROWTH

1980 = 81.8%

1981 86.7%

1982 42.6%

1983 15.9%



BASE RATES OF SIX NETWORKS

<u>NET</u>	<u>CONNECT HOUR</u>	<u>CHARACTER</u>	<u>COMMENT</u>
TYMNET (<1201)	4.25/200	\$0.05/0.01 KC	VERY COMPLEX DISCOUNT STRUCTURE
NET 1000 (<1201)	\$4.20	\$1.70 KP	TARIFF-LIKE
TELENET (<1201)	\$3.90/2.73	\$1.70/1.19 KP	CUM DISCOUNTS TO 30%, COMPLEX
COMPUERVE (<1201)	\$3.75/2.02	\$0.04/0.0225	DISCOUNTS TO 46%, FAST & DEEP FOR VOLUME
ADP AUTONET (<30)	\$3.00/2.03	\$0.03/0.0203	DISCOUNT TO 32.5%, SHALLOW SLOPE
UNINET	\$3.50/2.10	\$0.05/0.01	DISCOUNTS TO 40% (CUMULATIVE)

◦ IN GENERAL, STRUCTURES OF PRICING ARE SIMILAR IN NATURE WITH THE EXCEPTION OF NET 1000

◦ STRUCTURES VARY IN THE SLOPE OF DISCOUNT. FOR MODERATE TO LIGHT USAGE, THERE ARE SIGNIFICANT DIFFERENCES. THESE DIFFERENCES ARE LIKELY TO BE MODERATE AT HEAVY USAGE LEVELS.

◦ LIKE THE TIMESHARING BUSINESS, "DEALS" MAY BE MADE WHICH DO NOT APPEAR ON PRICE LISTS.

◦ MULTI-VENDOR ENVIRONMENT ALLOWS CUSTOMERS A VIEW OF ACTUAL COSTS. IN INPUT SURVEYS CUSTOMERS HAVE NOT INDICATED THAT ANY VENDOR WAS MATERIALLY CHEAPER IN PRACTICE. CUSTOMERS DID HAVE SERVICE & BILLING CONCERNS.

✓ PROBABLE OPERATING MARKET MECHANISMS:

- ATTRACT ON PRICE.
- RETAIN ON SERVICE.

RCA CYLIX

NOTED

- o ORIGINATED IN 1969 AS A BROADCAST INDUSTRY - SPECIALIZED PROCESSING SERVICES FIRM.
- o BURROUGHS SYSTEM REQUIRED POLLED TERMINAL CAPABILITIES, HENCE A BURROUGHS BASED NETWORK WAS DEVELOPED BY DCC (DIGITAL COMMUNICATIONS CORP)
- o WITH 1976 FCC DECISION ON RESALE, DCC BECAME A LAND-LINE SHARED NETWORK
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- o CYLIX BOUGHT BY RCA IN OCTOBER, 1982
- o NOT A SWITCHED NETWORK BUT A PRIVATE LINE EQUIVALENT SERVICE.
- o REVENUES ESTIMATED TO BE ABOUT \$30 MILLION IN 1983. NUMBER OF ORDERS DOUBLED OVER 1982 TO 4000.
- o ORIENTED TO SMALL TO MEDIUM-SIZE PRIVATE NETWORKS AND CLAIMS COST SAVING UP TO 50% OVER CONVENTIONAL PRIVATE NETS
- o HANDLES THE FOLLOWING PROTOCOLS
 - o BURROUGHS Poll Select
 - o 3270 BISYNC
 - o SDLC
 - o X.25 TO HOST
- o DURING 1983 WAS SUBSTANTIALLY RE-ORGANIZED AND REFOCUSED BY RCA AND NEW MANAGEMENT.
 - DEDICATED LANDLINE "BIAS" NETWORK & SERVICE
 - DEDICATED SATELLITE SERVICE
 - CURRENTLY OPERATING 34 GROUND STATIONS IN SPACE

o RAISED PRICES WHICH ARE CURRENTLY:

o \$450 MONTH PLUS \$15.00/MILLION CHARACTERS

FOR UP TO 9 TERMINALS

o \$425 PLUS \$15.00/MILLION FOR 10-49 TERMINALS

o \$370 PLUS \$15.00/MILLION FOR 50+ TERMINALS.

o CURRENTLY CONNECTING 225 HOSTS AND 3800 DROPS. NUMBER OF TERMINALS CONNECTED IS LARGER

o PROMOTES "END-TO-END" SERVICE AND INCLUDES LOCAL LINE CHARGES FROM LISA TO SITE IN PRICE.

o PRICING IS REUSED FROM PREVIOUS SCHEME WHICH WHICH INCLUDED CHARACTER ALLOCATION IN PRICE, E.G. \$345 MONTH PER REMOTE WITH 8 MILLION CHARACTERS INCLUDED.

o A SINGLE EQUIVALENT DROP NOW COSTS \$570 OR 65% MORE.

o 9.6 HOST CONNECTION RAISED 30% TO \$1300/MONTH

o PRICING SEEM SLANTED TOWARD LARGER USER. AVERAGE IS STILL SMALL AT 15-16 DROPS/CUSTOMER

o OFFERS 50% NON-PRIME CHARACTER RATE DISCOUNT.

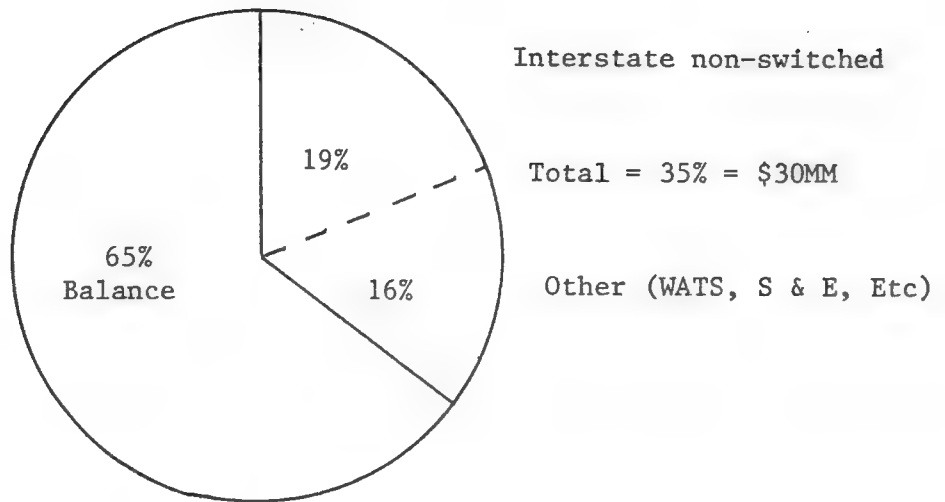
o RESPONSE TIME REPORTED TO BE IN 4-5 SECOND RANGE

o CYLIX IS BECOMING VERY AGGRESSIVE AND FEELS THAT THEY ARE WELL-POSITIONED FOR GOOD GROWTH.

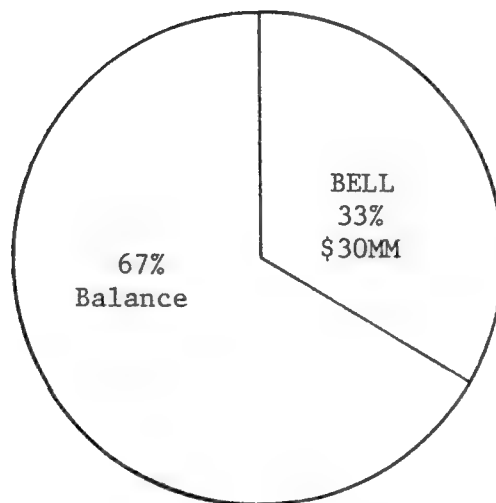
o CYLIX BELIEVES "END-TO-END" CONCEPT AND CURRENT APPROACH TO SERVICE PROVIDERS CREATE AN EXCELLENT ENVIRONMENT.

o ALSO CLAIM THAT PREVIOUS SERVICE QUALITY PROBLEMS ARE A THING OF THE PAST WITH NEW FOCUS ON SATISFIED ONLY.

TELENET & TYMNET BELL COMMUNICATIONS
EXPENDITURES
(1982)



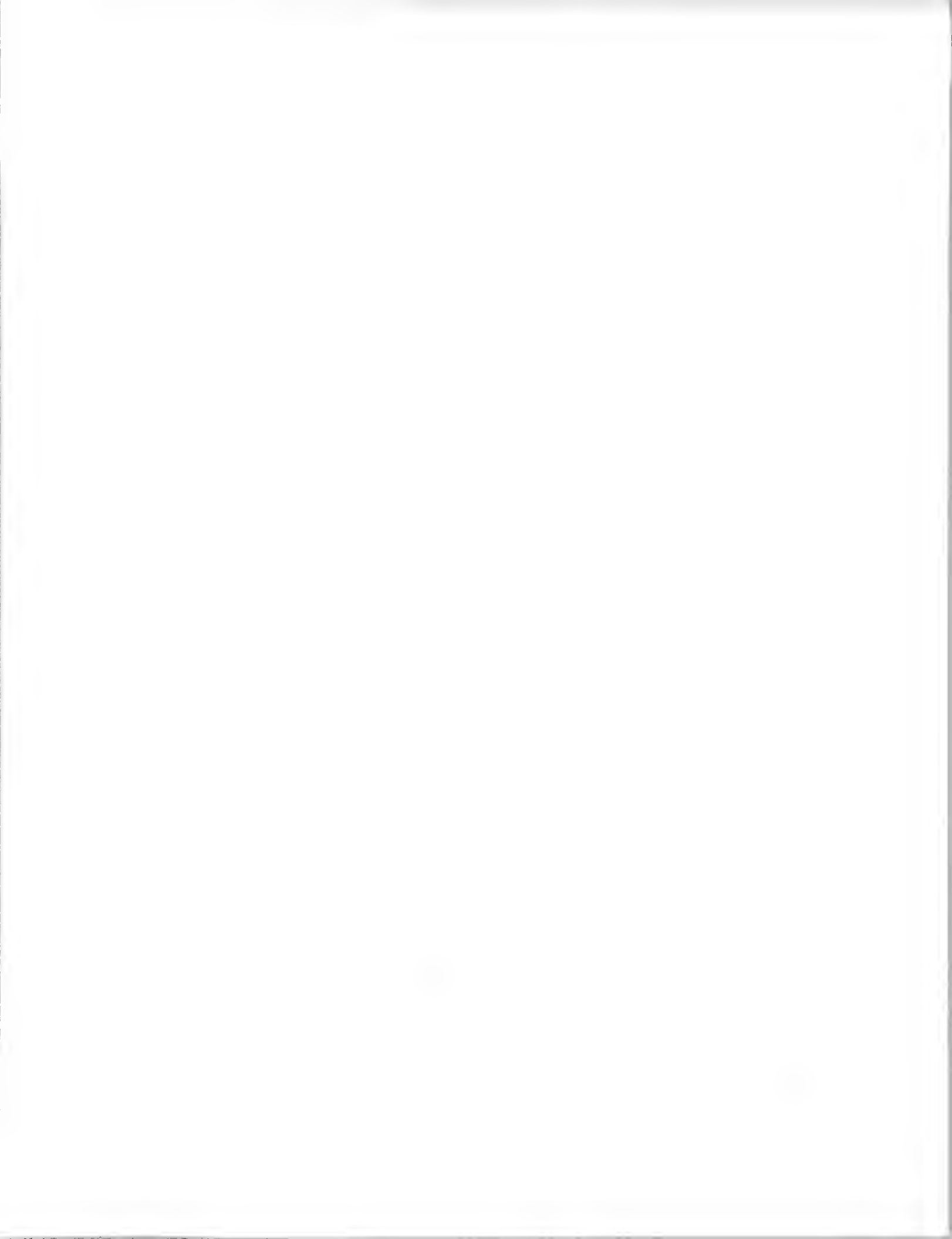
TYMNET = \$85MM



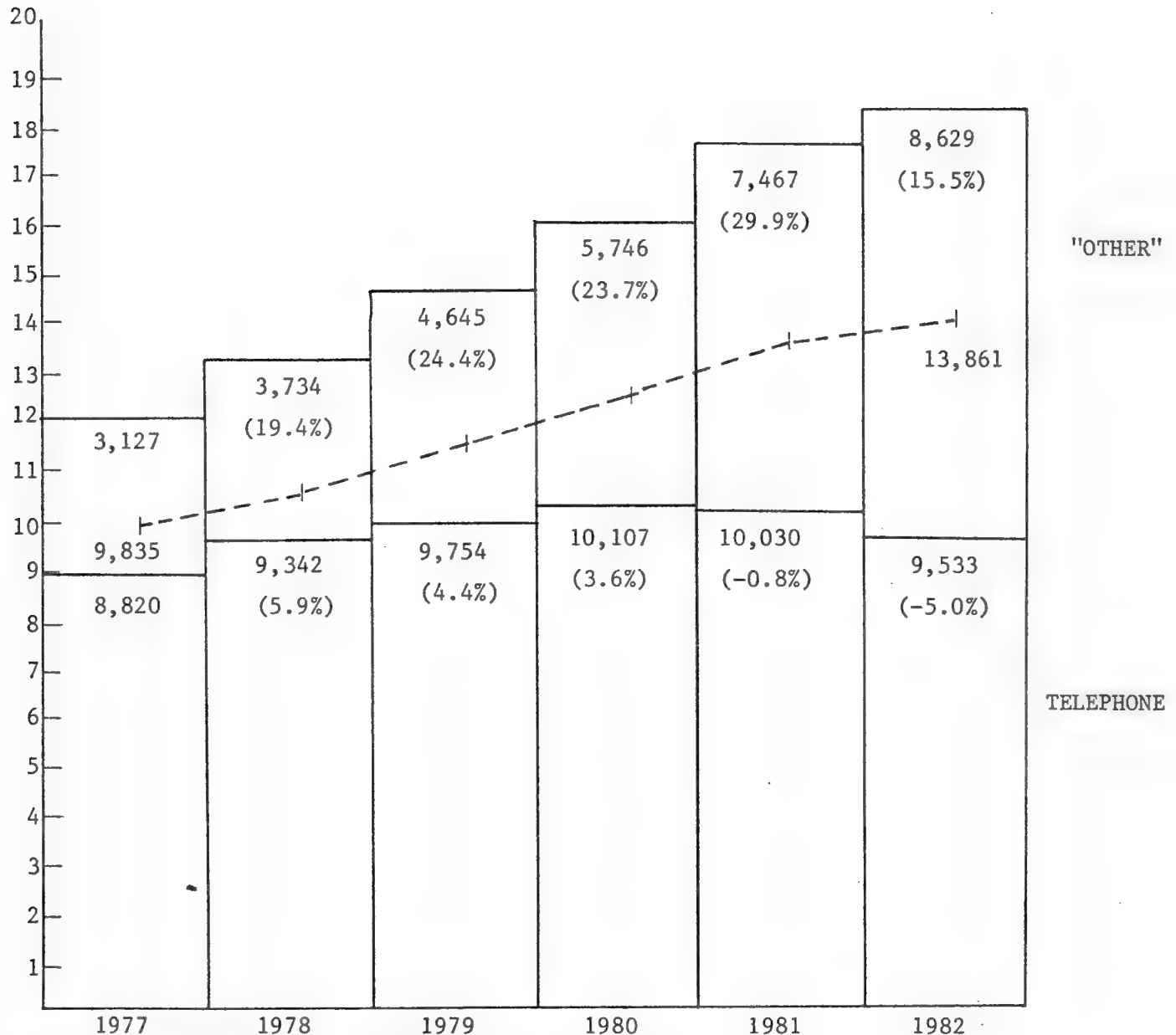
TELENET = \$90MM

(Breakdown not available)

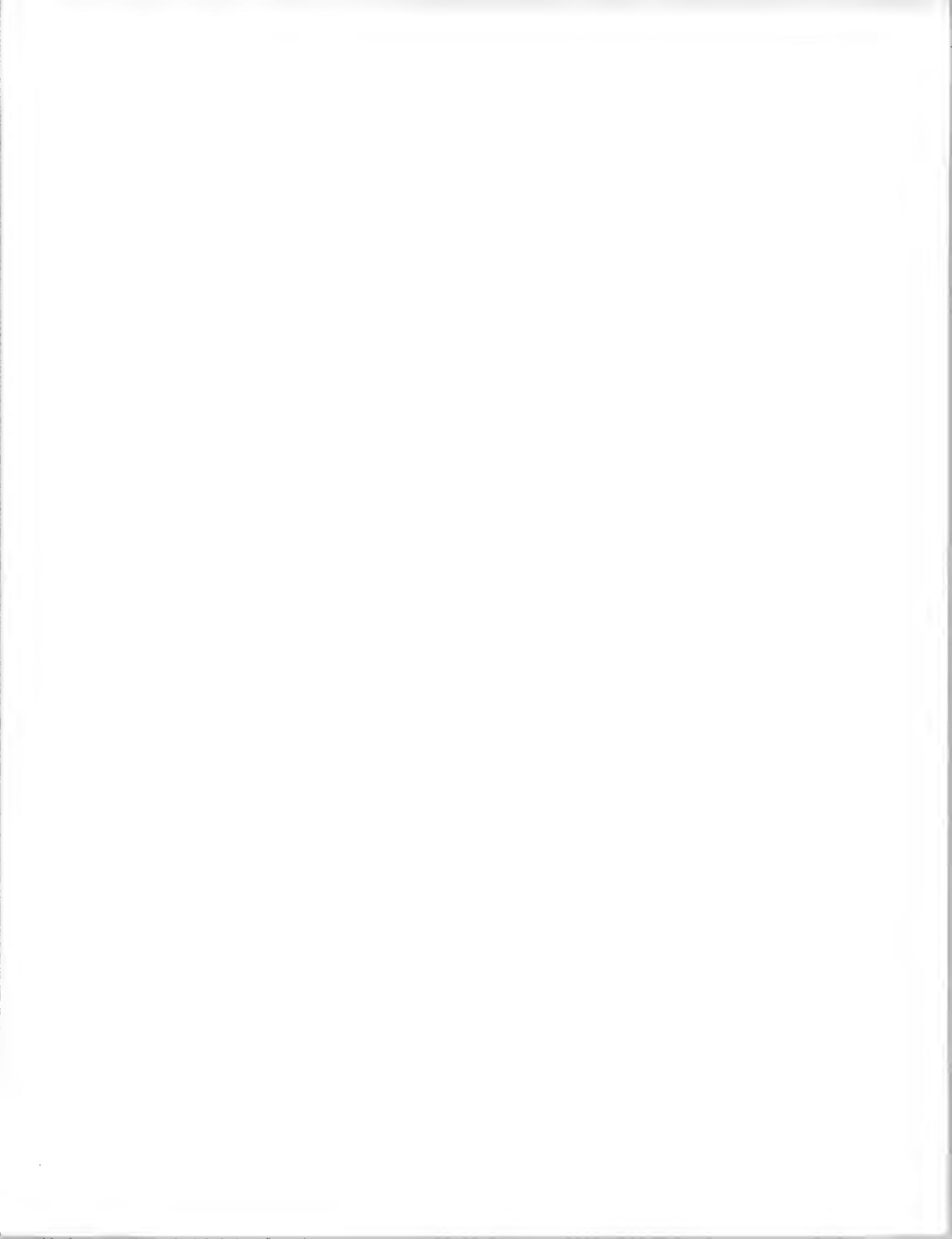
NOTE: Expenditures for both companies would be marginally higher due to lines into independent territories and international lines.



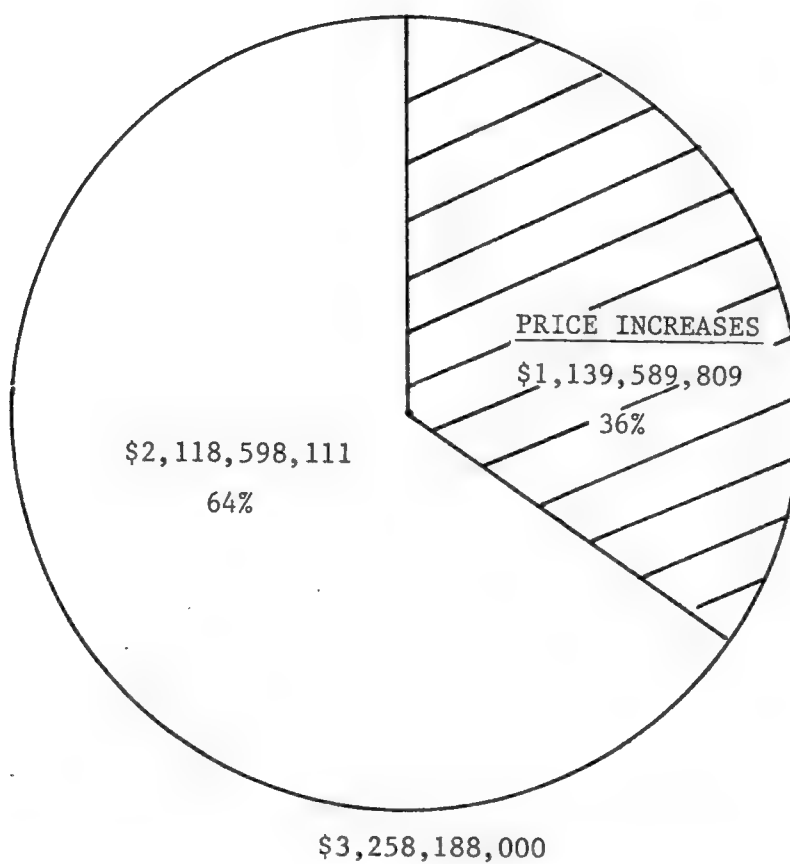
BELL SYSTEM PRIVATE LINE
INTERSTATE CUSTOMERS
1977 - 1982



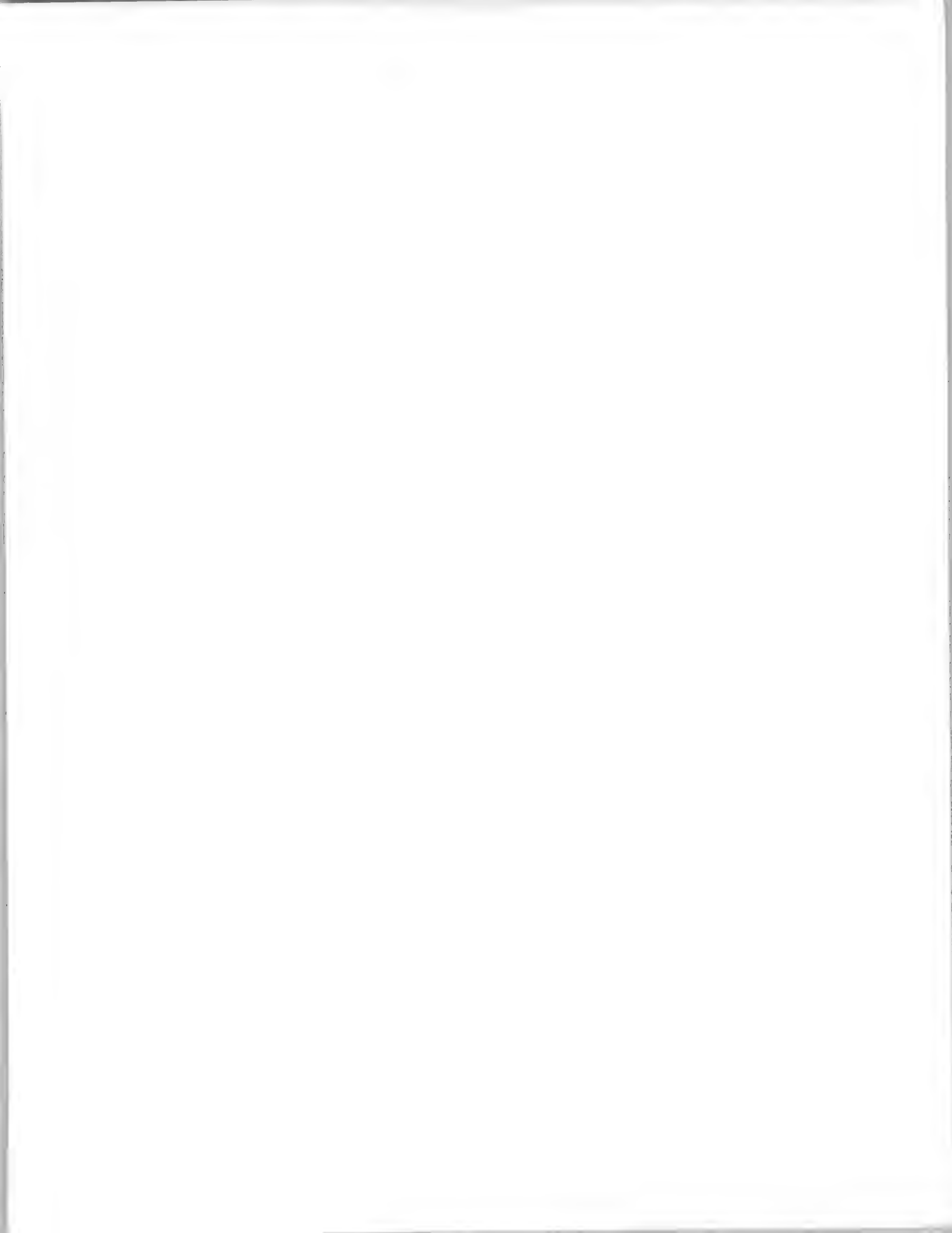
Average Annual Growth Telephone Private Line = 1.6%
 Average Annual Growth "Other" (Data) Private Line = 22.5%
 Average Annual Growth Total Private Lines = 7.1%



BELL SYSTEM INTERSTATE PRIVATE LINE
SHARE OF REVENUE DUE
TO
PRICE INCREASE
1977 Vs. 1982



"Real" Revenue Growth = 12.3% (Circuit Miles)
Reported Revenue Growth = 22.4% (Circuit Miles Plus Price Increases)

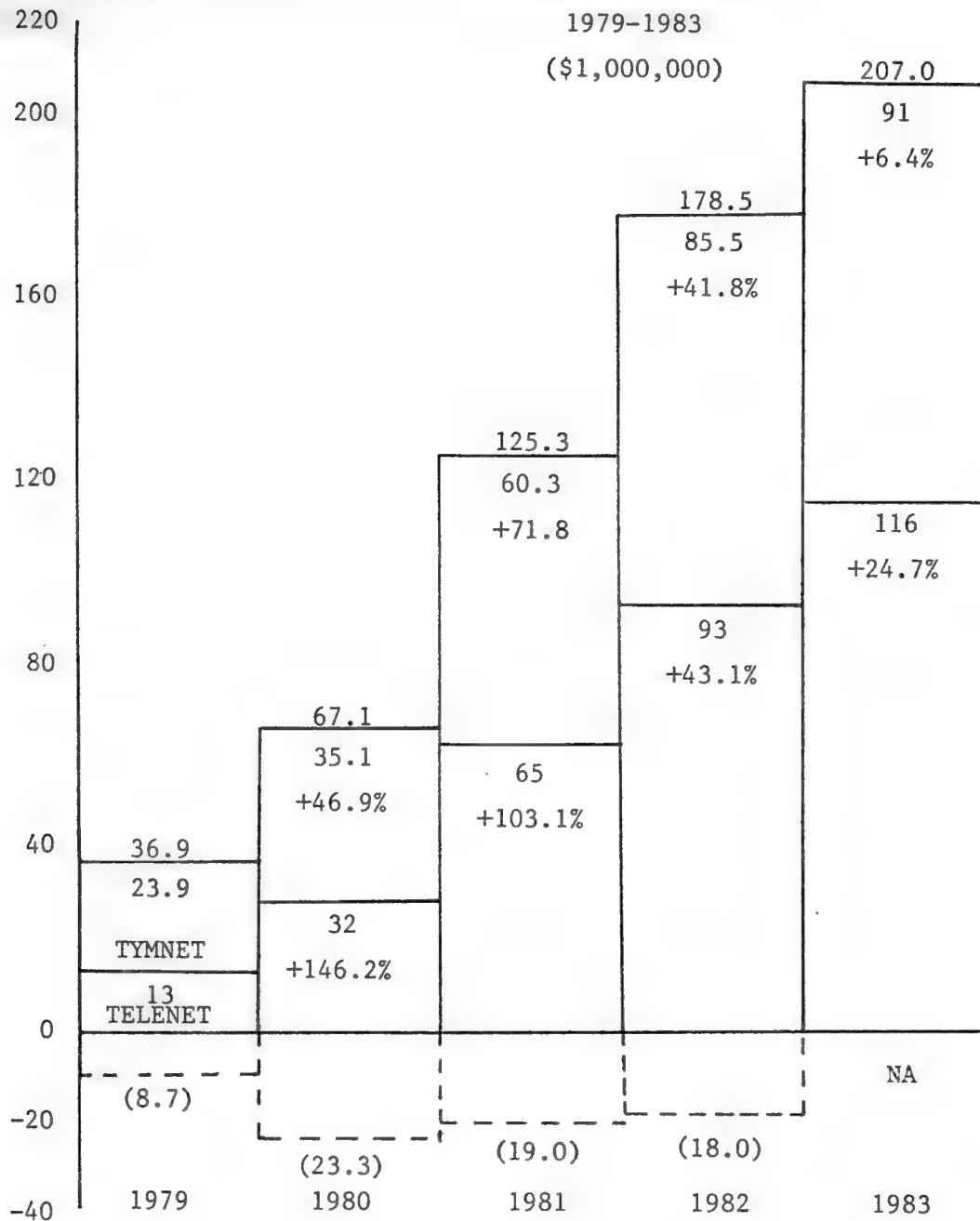


COMBINED TYMNET & TELENET

REVENUES & EARNINGS

1979-1983

(\$1,000,000)



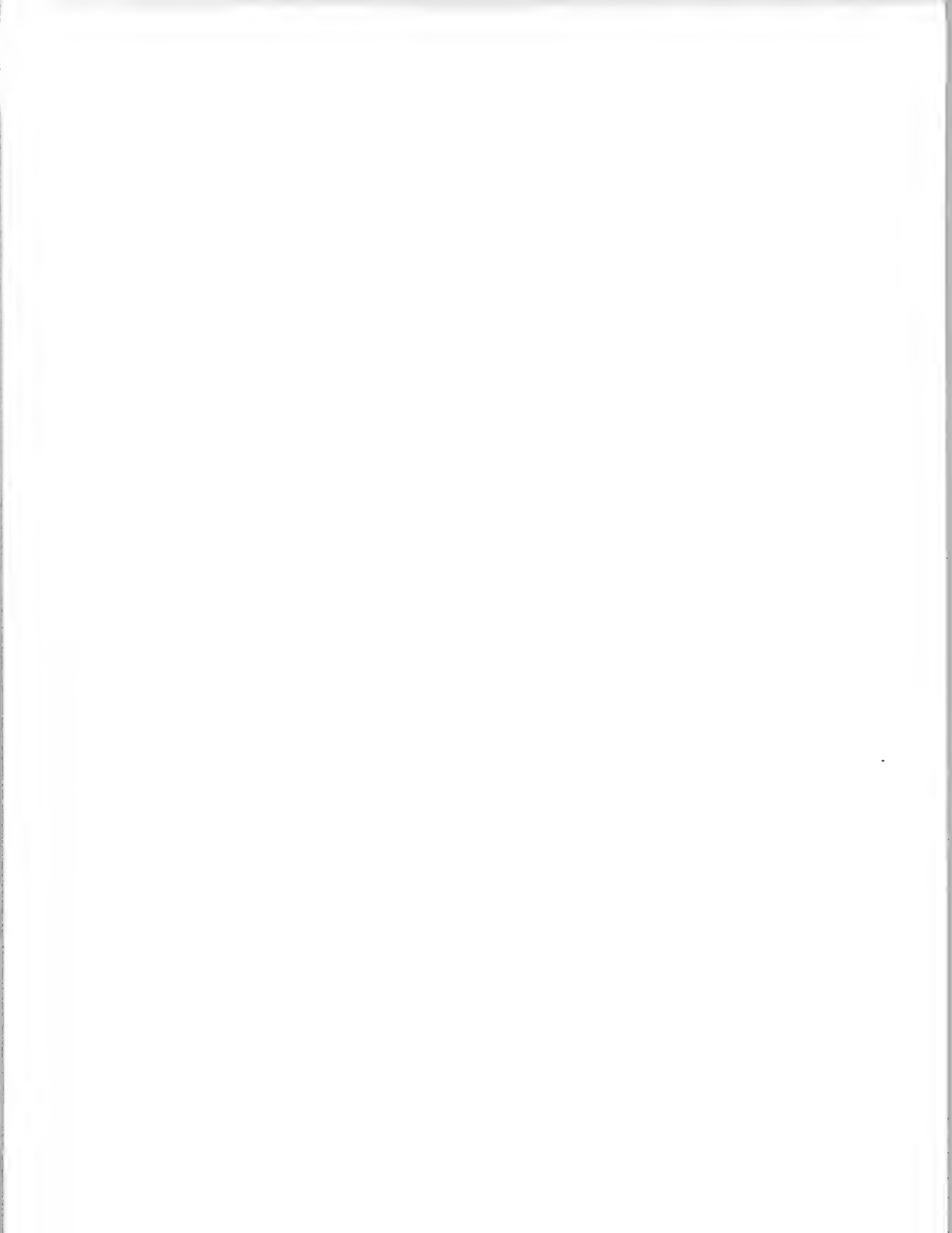
OVERALL GROWTH

1980 = 81.8%

1981 = 86.7%

1982 = 42.6%

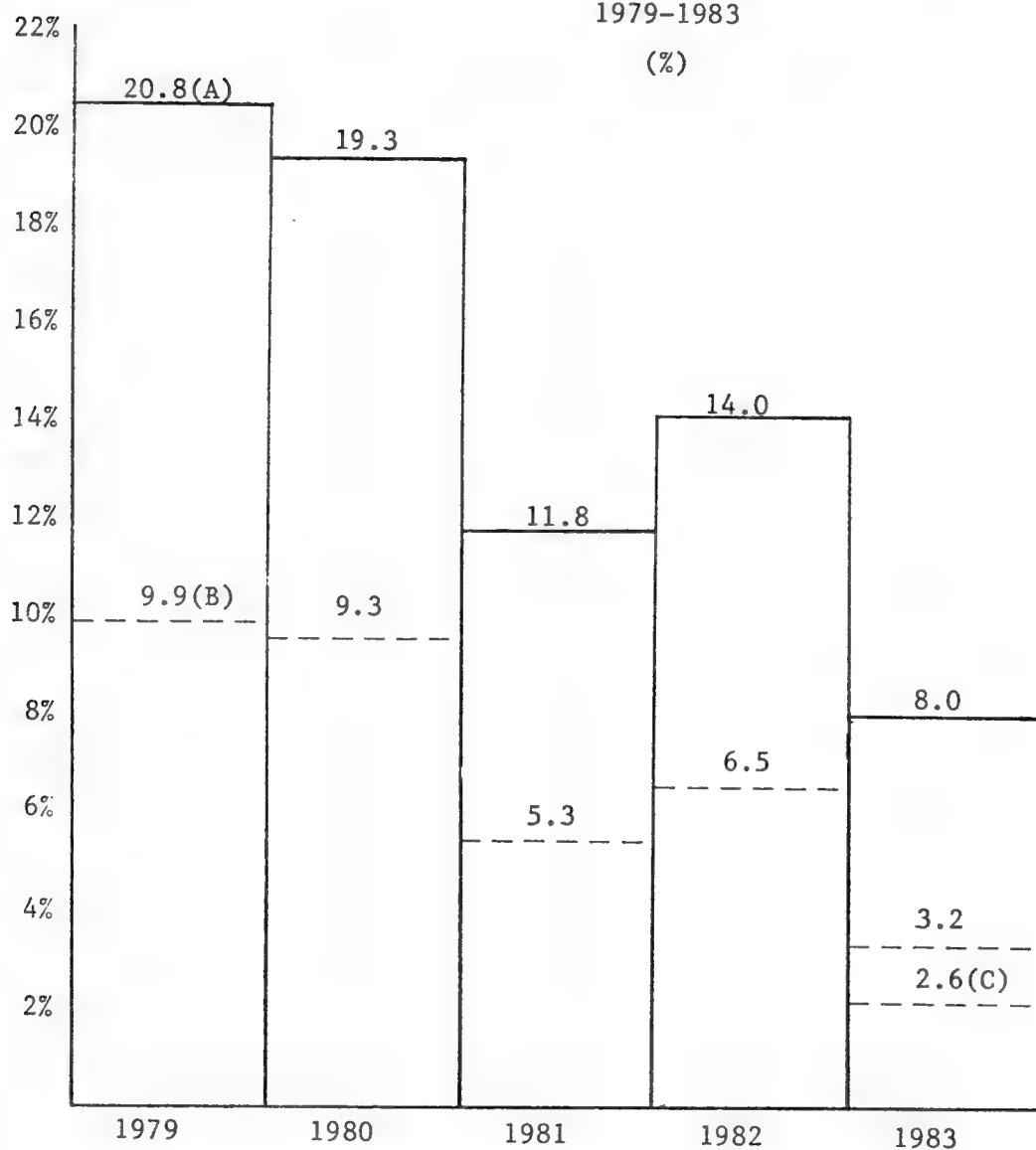
1983 = 15.9%



TYMNET MARGINS ON A REPORTED
AND TAX-ADJUSTED BASIS

1979-1983

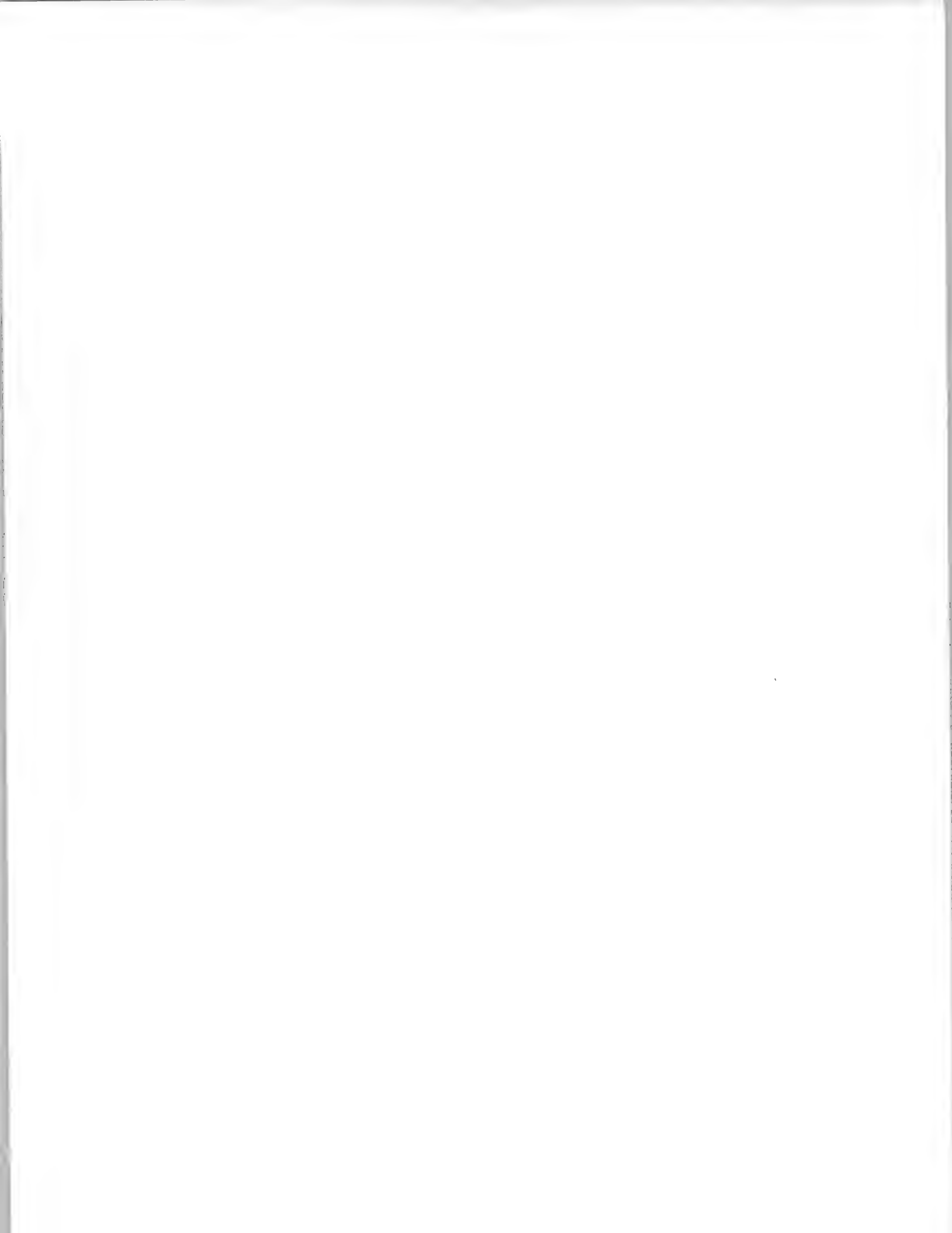
(%)



NOTES: (A) Operating profit as reported as a proportion of non-affiliated revenue.

(B) Operating Profit net of pro-rated corporate allocation and adjusted to 47% (full) tax rate as a proportion of non-affiliated revenue.

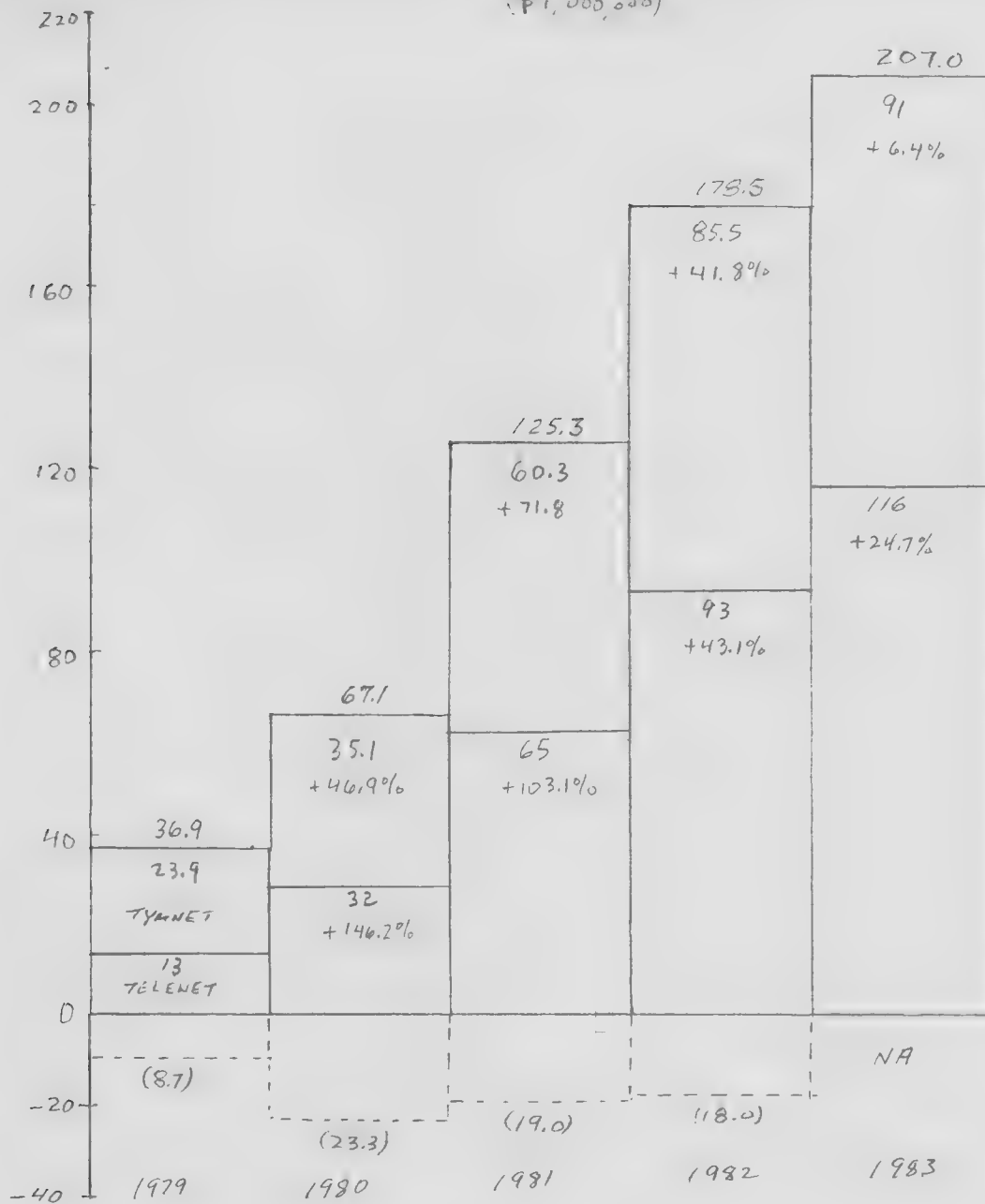
(C) Same as (B) except as a proportion of NAFF plus affiliated revenue.



COMBINED TYMNET & TELENET REVENUES & EARNINGS

1979-1983

(\$1,000,000)



OVERALL GROWTH

1980 = 81.8%
 1981 86.7%
 1982 42.6%
 1983 15.9%

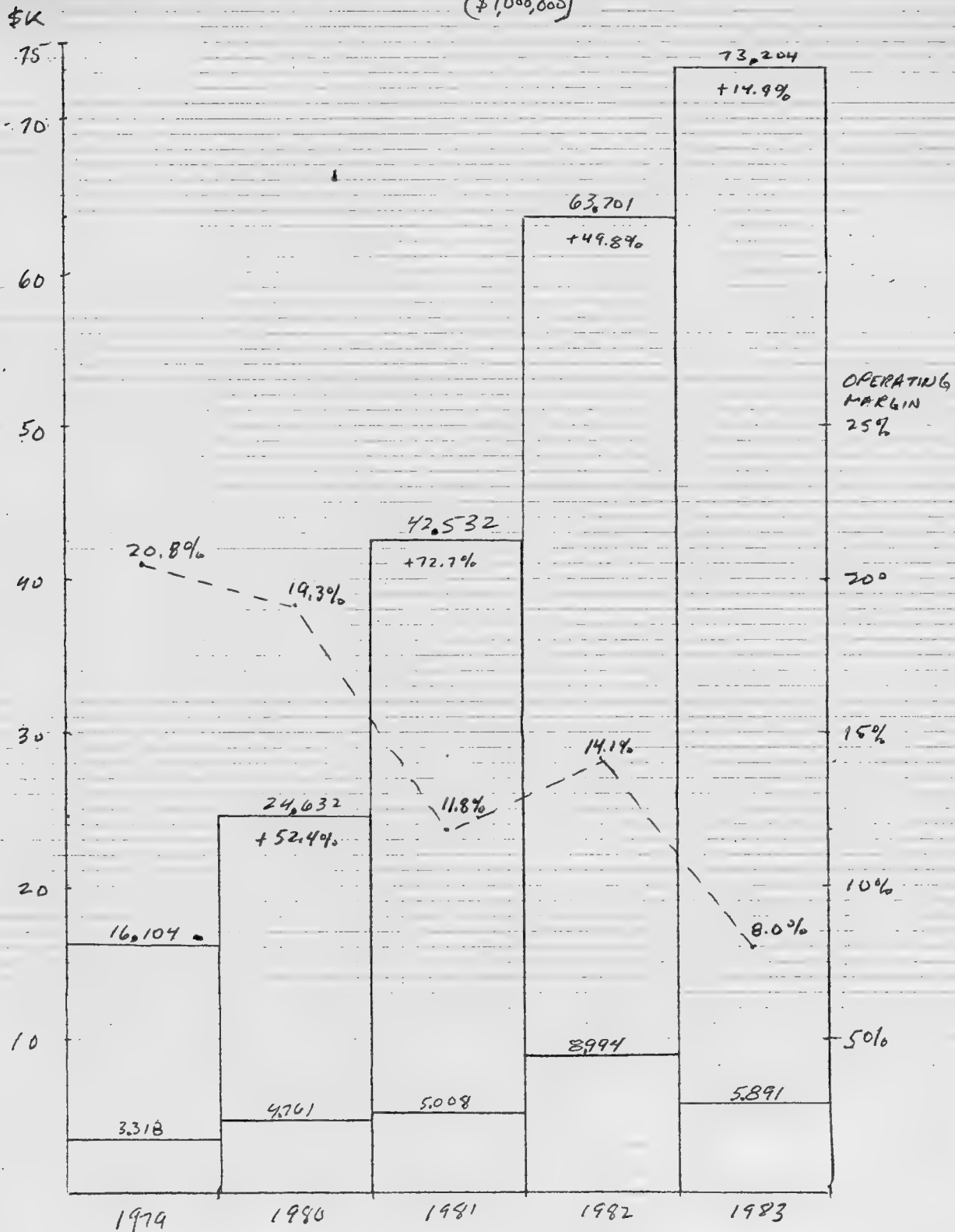
- o ABOUT TWO YEARS AGO, COMPU SERVE RE-ORGANIZED AND "BOKE OUT" THEIR NETWORK ACTIVITIES. IT IS NOW ONE OF THREE LOB'S, OTHER TWO ARE BUSINESS INFORMATION SERVICES & CONSUMER INFORMATION SERVICES
- o SINCE REORGANIZATION GROWTH HAS BEEN RAPID FROM A SMALL BASE. 100% INCREASE IN FY 1984 FROM 1983. 50% GROWTH PLANNED FORTY '85.
- o CURRENTLY HAS 300 NODES IN "CITIES," ALSO GATEWAYS TYMNET & Telenet, VIRTUALLY NO FX LINES. ALL NODES ARE HIERARCHICALLY EQUAL. \$3 Telenet & TYMNET SURCHARGE.
- o ABOUT 125 SALESPERSONS DEPLOYED IN 24 LOCATIONS PLUS 6 NETWORK SPECIALISTS IN EAST, MIDWEST & WEST. SALES PERSONNEL SELL BOTH NIS & BIS SERVICES.
- o OFFERING ONLY ASYNC AND X.25. DOES NOT PLAN TO OFFER IBM BISYNC OR SNA. FEELS THAT X.25 MAKES MORE SENSE AS A SYNC OFFERING AND THAT IBM WILL MOVE TO X.25. COMPU SERVE CAN "LEAPFROG" SNA IN THIS VIEW.
- o CURRENTLY CONNECTING A TOTAL OF 100 HOSTS, A "FEW" WITH X.25.



- o MAKING SOME USE OF SATELLITE (3-4) LOCATIONS FOR HIGH TRAFFIC CONCENTRATIONS. WOULD NOT PROVIDE DETAILS, BUT EXPECTS MORE USE.
- o BELIEVES IT HAS A MAJOR FEATURE IN A SYSTEM CALLED "CHAMP" THE CUSTOMER HOST ADMINISTRATION PROGRAM ALLOWS USERS TO "SELF-ADMINISTER" THEIR NETWORKS, SETTING TERMINAL PARAMETERS, DESIGNATING HOSTS AND ADMINISTERING USER PASSWORDS. FIRST 3 HOURS/MONTH FREE, THEN \$40.00 PER HOUR
- o EMPHASIS AREA (OTHER THAN ASYNC TRAFFIC) IS POS CREDIT VERIFICATION. BELIEVES NETWORK HAS FUNCTIONAL ADVANTAGES OVER CENTRALLY SUPERVISED NETS FOR THIS IN TERMS OF RESPONSE TIME.
- o CURRENTLY HAS "EXPEDITED MESSAGE" SOFTWARE ON 50 NODES AND HAS NATIONAL DEAL WITH VISA FOR POS VERIFICATION. ALSO WORKING WITH BANKS ON POS SYSTEMS. SMALL DEDICATED STAFF FOR THIS (4-6 PEOPLE)
- o EXPECTS TO GROW VERY RAPIDLY DUE TO "BIG DEMAND FOR COMMUNICATIONS." DOES NOT SEE ITSELF TAKING SHARE FROM TYMNET & TELENET. BELIEVES THERE IS MORE THAN ENOUGH BUSINESS TO GO AROUND.



TYNNET NON-AFFILIATED REVENUE
AND OPERATING PROFIT
(1979-1983)
(\$1,000,000)



NOTE: AS REPORTED IN SEC 10K'S.

TYMNET - MIL SESSIONS/MONTH

LINE			<u>TOTAL REC</u>	<u>REC/SESSION</u>
1979	1.5	18 M	23,916	1.33
1980	1.8	21.6M	35,135	1.63
1981	3.0	36.0M	60,092	1.67
1982	4.4	52.8M	85,484	1.64
1983	6.3	75.6M	91,024	1.20

	TOLL		TOLL INTERSTATE		TOLL INTERSTATE		LOCAL		TOTAL
77									
78	1699		1348		351		332		2031.
79	1964	-15.60	1537	+14.02	427	21.65%	384	15.66	2348 15.61
80	2244	-14.26	1804	+17.37	440	3.04	492	28.13	2736 16.52
81	3468	+54.55	2705	+49.94	763	73.41	638	29.67	4106 50.01
82	4335	+25.0	3259	+20.48	1076	41.02	787	23.35	5122 24.74

CIRCUIT MILEAGE

	DATA	TELEPHONE	COMB.
1977	32,621,654	56,987,706	89,608,360
1978	44,420,477	60,330,118	104,750,595
1979	53,003,991	67,806,397	120,910,388
1980	63,125,970	78,648,805	141,774,801
1981	71,821,419	84,762,404	155,983,823
1982	73,264,113	86,510,552	159,774,665

	\$ MILE/YR	MILES / CUMULATIVE
77	13.26	4,117
78	12.87	9,907.37 + 8.74%
79	12.72	12,480.64 - 9.79%
80	12.72	11,219 - 7.64%
81	17.34	11,219 + 1.84%
82	20.40	11,526.92 + 0.27%

PVT LINE TELEPHONE

1982 AVG LENGTH = 4257 MI
 1972 AVG LENGTH
 1972/82 CIRCUIT AAGR = 7.67%
 1972/82 MILEAGE AAGR = 6.70%
 1972 AVG LENGTH = 469.38

ALL PVT LINE REVENUE PER CUSTOMER

1977	120,807	
1978	127,478	+ 5.52%
1979	133,337	4.60
1980	143,611	7.71
1981	199,352	38.81
1982	235,105	17.93

PRIVATE LINE - DATA

1982 AVG LENGTH = 927.36 MI
 1972 " " = 640.63 MI
 1972/82 MILEAGE AAGR = 15.84%
 72/82 CIRCUIT AAGR 11.64%
 72/82 LL MILEAGE AAGR = 16.05%
 77/82 MILEAGE AAGR = 17.56%
 77/82 CIRCUIT AAGR = 13.80%

OF CUSTOMERS PL

	TELEPHONE	OTHER	← AAGR 22.02% 10 YR
72	7037	1179	8216
73	7279	1453	8732
74	7530	1768	9298
75	7736	2274	10,010
76	8282	2750	11,032
77	8820	3127	11,947
78	9342	3734	13,076
79	9754	4649	14,403
80	10,107	5746	15,853
81	10,530	7467	17,997
82	9,533	8,229	17,762

REVENUE AAGR INTERSTATE PVT LINE 77-82 - 22.36% YR.

77 = 1,188,133 \$120,806.61 AVG ANNUAL BILL PER CUSTOMER
 82 = 3,259,788 \$235,104.83 " " " 14.24% AAGR
 274 = 1,447,322 \$19,592.01/month
 79 = 1,526,966
 80 = 1,723,394
 81 = 1,820,202
 83E = +7.44% = 3,501,160.3

7YR SHARE

CAPITAL EXPENDITURES 1980-1983 \$23,849

RETURN ON ASSETS (PRETAX AND PRE-CORPORATE ALLOCATIONS)

1979 27.25%

1980 15.51%

1981 8.23%

1982 9.54%

1983 6.02%

NAFF REVENUE

1979 16,164

1980 24,632 +52.4%

1981 42,532 +72.7%

1982 63,101 +49.8%

1983 73,204 +14.9%

<u>OP + PROFIT</u>			<u>CORP ADJ</u>	<u>OP MARGIN</u>
1979	3318		279	20.5
80	4761	+43.5	431	19.3
81	5008	+5.2	741	11.8
82	8994	+79.6	-1232	14.1
83	5891	-34.5%	-1470	8.0

1979		3039	1611	FULL TAX NET	FULL TAX MARGIN
80	"	4330	1611	2295	9.94
81	"	4267		2266	9.32
82	ADJ PROF	7762		4114	5.33
83	ADJ PROF	4421		2343	6.51%
					3.20%

<u>ASSETS</u>	<u>PRETAX ADJ</u>	<u>% RETURN</u>
12,175	3039	24.96
30,691	4330	14.11
60,872	4267	7.01
94,038	7762	8.25
97,885	4421	4.52

83 (5,795)
101 286,641
101 224,313
101 224,313

DIVISION - Since '81

March '82

PROFESSIONAL

F.I.S.

Commenced on line accounting

Separate Sales - 5 persons

1 - 2000

1 - 1000

1 - 1000

1 - 1000

Automat - E Mail - Access: call division

Blending

+ Changehouse opportunities +

Phone for 3270 month SDLC/SNA

Revising price list Feb 84

Lower
prices

[Changehouse - big sale for all - 1st]

1st 1st 1st + large 1st 1st +
75 price 1st 1st

Hotel Water - most important management

Two Water to host - subsidized "reseller"

1200

99.9% AVAILABILITY

99.7% AVG. PRIME TIME

M.C.'s - looking at this - Port Cities

E - 179 - OVER 300

125 ~~125~~ 135 HOPE'S

Good Ports →



JUNE 1 X.25 DICK SWANSON & UNINET

SPED, KODIAK 124

REVENUE PER CIRCUIT MILE

	CUMULATIVE CIRCUIT MILES		
1,188,133	1977	89,603,360	13.26
1,347,822	1978	104,750,595	12.87
1,536,966	1979	120,810,589	12.72
1,853,494	1980	141,774,861	12.72
2,705,202	1981	156,563,823	17.28
3,258,188	1982	159,774,635	20.40

1982 CIRCUIT MILES @ 1977 PER MILE RATE = \$2,118,598,191 =
65.01% OF \$3,258,188 REVENUE 1982

1982 CIRCUIT MILES @ 1979 PER MILE RATE = 2,032,674,390
= 62.40% OF 1982 REVENUE

880,728 1972 DL RCU

62,074,279 MILES 1972 = 14.19

$$\#107 = 8/16 = 13.38 \text{ m/16}$$

79 28 53

80 45 68

81 80 105

82 107 137

83 135

$$1982 = 90.32 = -22.65 \text{ m/16} = 6.75 \text{ m/16}$$

$$1983 = 113.73 \text{ " " } 8.5 \text{ m/16}$$

$$1981 = 62.89 \text{ " " } 4.7 \text{ m/16}$$

$$1980 = 33.45$$

$$1979 = 13.5$$

LOSSES

1984	27	TEL	TYM	COMB	CHRS
81	24	1979 13	24	37	79 13.5
80	28	1980 33	35	68	80 31.9
79	12	1981 63	60	123	81 65.2
		1982 90	85	175	82 93.4
		1983 113	91	204	83 115.7

35 LATAS - Serial 200-350

A

14 different lost boxes

you will find

13

32

65

93

116

TELETYPE AMPLIFIER	TEL	REV. (m)
1979 3.6	3.61	
1980 7.2 +100	4.58	+28.81%
1981 16.4 +133.3	3.75	-18.12
1982 36.8 91.4	3.13	-16.53
1983 51.6 84.29	2.19	-30.03

cells HAGR 61032

0 MAKING SOME USE OF SATELLITE GPS LOCATIONS
FOR HIGH-TRAFFIC HIGH-DRUG-USE HOTSPOTS
INSTEAD OF ONLY SET EXPOSURE LOCATIONS.

[illegible]

EMPHASIS AREA (OTHER THAN FINE TUNE) IS
POSITIVE VERIFICATION. THE NETWORK HAS
NOTED NO FLUENTAGE. THE NETWORK HAS
NOTED FOR THIS IN THE FINE TUNE.

ALSO WORKING WITH ISRAELIS
ON PDS SYSTEM. SMALL DELICATE - (PDS)
(PDS)

CITIES

TERMINAL/BALE/AC/VTAM
SPEEDS 2400, 4800, 9600

TERMINAL TYPES: 3270 WITH EOLC OR BSC

HOST PROTOCOL SPEEDS: 4800, 9600

HOST SOFTWARE REQUIRED: ACF/VTAM; ACF VTAME OR BTAM
AND IMS/VS OR CICS/VS.

HOST SOFTWARE SUPPORTED FOR SNA: ACF/VTAM w/ MSNF AT VI.R3
OR MVS; ACF/VTAM w/ MSNF AT VI.R2 or VI.R3 ON K.S USE;
ACF/VTAME; ACF/NET VI.R2 or VI.R3.

0 SEPARATE GROUP FORMED IN SPAIN 1922 AFTER
1 YEAR OF REPRESSION

\$5.00

1. The first step is to identify the problem or question that needs to be answered.

LEADS PROVIDED BY ADF/NS LINES FORCE BUT WAS
SIX (6) DELICATED LINES PERSONS IN NY/NJ, ATLANTA,
AND ALEXANDRIA, VIRGINIA.

PR-1714 DIRECTOR'S 2-1-54 10-1-54 1-1-55 2-1-55
15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Simone -, 1957-1958.

11/10/1918 DE Vol 84, 1. 11/10/1918 DE Vol 84, 1.

WILL REMAIN LARGELY AN ALP ACTIVITY.

THESE INSERTS MARKED ON NEXT
TWO PAGES

INSERT A

0 IS NOT SEEING ANY UNUSUAL GROWTH IN SDC REVENUE
AND THIS HAS NOT BEEN ASSESSED

ESTIMATE THAT ABOUT 15% OF THE SDC REVENUE IS TO
BE BUDGETED NEXT AND SDC LAST.

INSERT B

0 HAS 10 SALES OFFICES AND 20 "PURE" SALESMEN IN THE CO.

TYPICAL

SALES OFFICE IN THE CO.

1. SALES OFFICE

2. SALES OFFICE

3. SALES OFFICE

0 SELLS HEAVILY ON PHONE. HAS ATST NETWORK
CONFIGURATION PROGRAM. WHEN IT COMES, THEN
SHOWS TO PRESENT ALONG WITH LIST OF WORK.
"ALWAYS" COMES UP OFSS FREELY. THEN THE FRIEND
ALWAYS IS MADE. (NO MULTIPLE T-10 CONTACTS, NO
MULTIPLE T-10 CONTACTS, NO MULTIPLE T-10 CONTACTS)

RCA CYLIX

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- o BURROUGHS SYSTEM REQUIRED FULL TERMINAL CAPABILITIES, HENCE A DEDICATED BASE NETWORK WAS DEVELOPED BY DCC (DIGITAL COMMUNICATIONS CORP)
- o WITH 1976 FCC DECISION ON RESALE, DCC BECAME A LAND-LINE SHARED NETWORK
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- o HANDLES THE FOLLOWING PROTOCOLS
 - o BURROUGHS Poll Select
 - o 3270 BISYNC
 - o SDLC
 - o X.25 TO HOST
- o INSERT A
- o DURING 1983 THE COMPANY RE-ORGANIZED AND RE-FOCUSED BY RCA AND NEW MANAGEMENT:
 - PRESENT DEDICATED BASE NETWORK
 - SATELLITE NETWORK
 - CURRENTLY OPERATING 34 SATELLITE STATIONS
 - 10 STATIONS

o BASED PRICE WITH ANCE CREDIT

o \$450 MONTH PLUS \$15.00 MILLION CREDIT

o 12 MONTH TERM

o \$425 MONTH PLUS \$15.00 MILLION CREDIT 12 MONTH TERM

o \$400 MONTH PLUS \$15.00 MILLION CREDIT 12 MONTH TERM

o CURRENTLY 125,000 AND 3500
LINES. NUMBER OF TERMINALS CURRENTLY IS 1,000

THEY ARE TRYING TO GET THE PRICE DOWN TO \$300
PER MONTH FOR 12 MONTH TERM.

THEY ARE TRYING TO GET THE PRICE DOWN TO \$300
WHICH INCLUDED CREDITER ALLOCATION IN PRICE,
E.G. \$345 MONTH FOR REMOTE WITH 100,000
CREDITER INCLUDED.

A SINGLE TERM MONTHLY PRICE IS \$570 OR
65% MORE.

4.6 HOST CONNECTION FROM 30% TO 1300, MONTH

o PRICING SEEM SLANTED TOWARD CARRIER USER, AVERAGE
IS STILL SMALL AT 15-16 DROPS/CUSTOMER.

o OFFERS 50% NON-PRIME CARRIER RATE DISCOUNT.

o "NO UPS, NO DOWNS"

o RESPONSE TIME REPORTED TO BE IN 2.8 SECONDS OR BETTER
80% OF TIME, AND 10% OF TIME EXISTING WITH
WITH USERS.

o CYLIX IS BECOMING VERY AGGRESSIVE AND FEELS THAT
THEY ARE WELL POSITIONED FOR THE FUTURE.

o THEY ARE TRYING TO GET THE PRICE DOWN TO \$300
PER MONTH FOR 12 MONTH TERM (PRICE AN EXCELLENT
OFFER).

o ALSO CLAIM THAT PREVIOUS SERVICE QUALITY PROBLEMS
ARE A THING OF THE PAST AND ARE NOT A
SERVICE ISSUE.

TYMNET CHRONOLOGY

IN GENERAL, BOTH TYMNET AND TYMSHARE EVENTS IN THE LAST YEAR HAVE CENTERED AROUND THE FOLLOWING AREAS, FOR TYMNET:

- 7/83 OFFERS 2400 BPS ASYNC IN 34 CITIES BY FULLY 1984 THROUGH 3270 EMULATION BY PC'S AND VT100'S FOR THE SERVICE AND COMPANY'S BEST ADVANTAGE OVER CONVENTIONAL 3270 SERVICE AND ACCESS TO 3270 APPLICATIONS
- 7/83 ANNOUNCES PROGRAM TO VERIFY AND TEST THIRD PARTY PC TERMINAL EMULATION SOFTWARE. A MAJOR CONCERN IS TO VERIFY PC TO VT100 TO 3270 IBM PC'S, APPLE II'S AND DEC RAINBOWS RUN UNDER THIS PROGRAM.
- 8/83 - ANNOUNCES HOME BANK IS NOW NETWORKED WITH VALUE AT \$1.5 MM
- 9/83 - ANNOUNCES CASE INTERNATIONAL NET FOR NEW YORK, LONDON, PARIS, GENEVA, BATHRAIN, PANAMA CITY, SINGAPORE, HONG KONG AND JAKARTA. PRIMARILY FOR INTERNAL FINANCIAL REPORTING BUT SOME CLIENT USE EXPECTED.
- 12/83 CERTIFIES 20 MORE X.25 INTERFACES AND GATEWAY DEVICES BRINGING TOTAL TO 70 DEVICES. MOSTLY X.25 PADS AND ONE ETHERNET LINK
- 12/83 OFFERS NEW ASYNC TERMINAL CONCENTRATOR AT \$439 PER PORT (\$3500 UNIT), 1/4 THE COST OF PRIOR CONCENTRATOR. 8 IN, 2 OUT AT UP TO 9.6 kbps

TYMNET CHRONOLOGY, CONT'D

- 1/84 DECLARES 17 NODE ALASCOM NET OPERATIONAL IN SEATTLE, ANCHORAGE AND OTHER CITIES, CONTRACT VALUE \$2 MM, INSTALLED IN SEVEN MONTHS SUPPORTING ASCII, 3270, 2780, 3780, HIGH RESOLUTION, 1.25 AND 5MB SEC

- 3/84 INTRODUCES ASYNC OUTRIDE AT 300/1200 IN HIGH & MEDIUM RISKY COUNTRIES, CITES USE IN TRANSMITTING BILLS OF LADING, INVENTORY, FINANCIAL STATEMENTS

ADDITIONALLY, MOST TYM SHARE NEW SERVICE ANNOUNCEMENTS HAVE ALSO BEEN HEAVILY COMMUNICATIONS ORIENTED. KEY ITEMS INCLUDE:

- EDI-NET (ELECTRONIC DATA INTERCHANGE NETWORK) FOR MULTIPLE TO-PO-PO SHIPMENT FROM SUPPLIER INTER-COMPANY. CLAIM 27 COMPANIES USING AS OF 1/84 FOR ^{P.O.'S} INVOICES AND DISTRIBUTION DOCUMENTS. HANDLES PROTOCOL AND FORMAT CONVERSIONS. AN ELABORATION OF STORE & FORWARD E-MAIL.

- ANNOUNCED TRUCK/TRACE FOR SHIPMENT LOCATION. PART OF EDI-NET, ALLOWS ACCESS TO SHIPMENT LOCATION DATA.

- IMPROVED E-MAIL (ONTYME) SERVICE BY LINKING WITH T/S SERVICE. DATA MAY BE PULLED FROM T/S FILES BY ONTYME

- ADDED DUNRON TERMINAL FOR PDS CREDIT VERIFICATION
- BETA TEST FOR PC USER MAIL ADDRESS.

IN THE MEAN TIME, THE TYM SHARE 'TYMNET STRATEGY' LEADS TO SERVICE EXPANSION TO BECOME AN END-TO-END DATA COMM AND PROCESSING SERVICE INCLUDING DATA COLLECTION, TRANSMISSION, STORAGE AND DISTRIBUTION. FUNCTIONS ARE PERFORMED BY TYM SHARE AND BY OTHER COMPANIES.

CONT'D

o IN GENERAL, THERE HAS BEEN AN INCREASE IN
ADDS TO THE TYNHABE/RYANET (1970) TO
THE TYNHABE/RYANET (1970) TO
THE TYNHABE/RYANET (1970) TO

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SINCE THE TYNHABE/RYANET (1970) TO THE TYNHABE/RYANET (1970) TO
THE TYNHABE/RYANET (1970) TO THE TYNHABE/RYANET (1970) TO
THE TYNHABE/RYANET (1970) TO THE TYNHABE/RYANET (1970) TO

o INTEGRATION OF THREE MCS NETS AND FOUR MAINFRAME
MACHINES (IBM, DEC, HONEYWELL, XEROX) FROM THREE
AGENCIES TO ONE TO BE DONE.

BELL PRIVATE LINE MARKET

- o ALSO OBSERVE THE PATTERN OF MILEAGE GROWTH. RAPID GROWTH 1977-1980 FOLLOWED BY A SHARP TURN IN 1981.

GROWTH IN PL REVENUE APPEARS TO BE RELATED TO COST PRICE INCREASES, ON A REVENUE PER MILE BASIS. REVENUE PER MILE INCREASED BY 35.8% IN 81/82. CONVERSELY, COST MILES INCREASED APPROX.

- o IN 1981 (JUNE) THERE WAS A MAJOR PRICE INCREASE PUSHING PER MILE REVENUES UP BY 35.8% MILEAGE GROWTH SLOWED OFF MAINTAINING REVENUE PER MILE INCREASE. MAINTAINED IN 1982. OTHER APPROPRIATE MILEAGE GROWTH.

- o FROM THE STANDPOINT OF BILLS SEEN BY THE CUSTOMER, THE INCREASE WERE EQUALLY SHARP, HOWEVER THE AVERAGE BILL GROWTH 14.2% PER YEAR, LEAST SIGNIFICANT INCREASE SEEN IN 1981 & 1982. - THE 1981 INCREASE IN PL REVENUE 35.8% IN 81/82.

- o FROM THIS DATA WE CAN SEE THE AVERAGE GROWTH IN PL REVENUE WAS 22.4% ON THE BASIS OF CIRCUIT MILES AND 22.4% ON THE BASIS OF REVENUE. APPROXIMATELY 36% OF GROWTH IN PL REVENUE WAS DUE TO PRICE INCREASES (ALL IN 81/82) AND 64% WAS GROWTH IN CIRCUIT MILES.

- o THE BEHAVIOR OF VAN USAGE CLOSELY TRACKS THE PL PATTERN SINCE VANDERS TRACKS - PRICE INCREASES IN VAN USAGE TRACKS -

BELL PRIVATE LINE MARKET

AN ESTIMATED
O THE BELL PRIVATE LINE INTERSTATE MARKET REACHED \$3.5
BILLION IN 1983 BY INPUT ESTIMATE. THE LONG TERM
GROWTH RATE IS ABOUT 19.1% PER YEAR IN REVENUES.
THE 1977 TO 1982 RATE WAS EVEN MORE (19.1% PER YEAR),
27.1% PER YEAR.

IN 1983 THIS MARKET WAS THE THIRD LARGEST
IN THE BELL MARKET. IT IS NOT SO MUCH A
MARKET AS IT IS AN ENVIRONMENT SINCE VANS
CARRIER
PASS THROUGH TO THE FLTH SUBSTANTIAL PORTION OF
THEIR REVENUES.

O PROPELLING THIS MARKET HAS BEEN THE GROWTH OF
THE AT&T CLASSIFICATION "OTHER" PRIVATE LINE. "OTHER"
IS THE ONLY FL FOR FLTH. NOTE THAT OF THE TOTAL
3,261 CUSTOMERS IN 1982 62.3% WERE USING OTHER
PRIVATE LINE. THE GROWTH OF THIS 5 YEAR
PERIOD WAS 31.8%.

O EXPRESSED ANOTHER WAY TOTAL PRIVATE LINE CUSTOMERS
GROW AT A RATE OF 3.1% PER YEAR WHILE REVENUE
GROWTH WAS 19.1% PER YEAR. REVENUE FROM
LINE GROW AT AN AVERAGE RATE 1.6% PER YEAR 1977-1982
THE GROWTH OF THIS 5 YEAR PERIOD WAS 31.8%.

O OBSERVE THAT ROUT MILES INCREASED AT A MUCH LOWER
RATE THAN REVENUES OVER THE PERIOD. AVERAGE
IN REVENUE GROWTH WAS 19.1% PER YEAR.

CH/PR/TH

BASE RATES OF SIX NETWORKS

NET	CONNECT HOUR	CHARGE	COMMENT
TYMNET (<1201)	4.25/200	\$0.05/0.01 KC	VERY COMPLEX AND DENSE STRUCTURE
NET 1000 (<1201)	\$4.20	\$1.10/KP	TIME-OF-DAY LIKE
TELENET (<1201)	\$3.90/1.73	\$1.70/1.19 KP	SAME AS TYMNET, BUT WITH A DIFFERENT DISCOUNT
COMSERVE (<1201)	\$3.75/2.02	\$1.00/0.01	DISCOUNT TO 32.5%, SLOW SLOPE
ARP AUTONET (<30)	\$2.00/2.03	\$0.03/0.0203	DISCOUNT TO 40% SLOW SLOPE
UNINET	\$3.50/2.10	\$0.05/0.01	DISCOUNT TO 40% SLOW SLOPE

IN GENERAL, STRUCTURES OF FIVE AND SIX NETWORKS ARE SIMILAR TO NETWORKS WITH THE SAME NUMBER OF NETWORKS.

THE STRUCTURE OF THE FIVE NETWORKS IS SIMILAR TO THE STRUCTURE OF THE SIX NETWORKS, BUT THERE ARE SOME DIFFERENCES. THESE DIFFERENCES ARE LIKELY TO BE MINOR AT HEAVY USAGE LEVELS.

THE STRUCTURE OF THE FIVE NETWORKS IS SIMILAR TO THE STRUCTURE OF THE SIX NETWORKS, BUT THERE ARE SOME DIFFERENCES. THESE DIFFERENCES ARE LIKELY TO BE MINOR AT HEAVY USAGE LEVELS.

MULTI-VENDOR ENVIRONMENT ALLOWS CUSTOMERS TO CHOOSE FROM A RANGE OF VENDORS. IN INPUT SURVEYS CUSTOMERS HAVE NOT INDICATED THAT ANY VENDOR HAS A SIGNIFICANTLY BETTER SERVICE THAN THE OTHERS. CUSTOMERS DID HAVE SOME DIFFERENCES IN SERVICE.

PROBABLE OPERATING MARKET MECHANISMS:

- ATTRACTION FORCE.
- POSITION SERVICE.

COMPOSERIE

0 HOST TWO YEARS AGO, COMPOSERIE RE-ORGANIZED

HIS ROOMS TO GET IT INTO A BETTER STATE.

0 NOW HE IS TRYING TO GET IT INTO A BETTER STATE

RE-ORGANIZATION OF HIS ROOMS TO GET IT INTO A BETTER STATE

0

0 COMPOSERIE IS TRYING TO GET IT INTO A BETTER STATE

0 COMPOSERIE IS TRYING TO GET IT INTO A BETTER STATE

0 COMPOSERIE IS TRYING TO GET IT INTO A BETTER STATE

0 COMPOSERIE IS TRYING TO GET IT INTO A BETTER STATE

0 COMPOSERIE IS TRYING TO GET IT INTO A BETTER STATE

0 COMPOSERIE IS TRYING TO GET IT INTO A BETTER STATE

0 \$3 TELETYPE & TELETYPE SYNCHRONOUS.

0 ABOUT 25 SECONDS IS DELAYED IN 24 HOURS

0 COMPOSERIE IS TRYING TO GET IT INTO A BETTER STATE

0 COMPOSERIE IS TRYING TO GET IT INTO A BETTER STATE

0

0 OFFERING ONLY ASYNC AND X.25. DOES NOT MEAN TO
OFFER IBM RISC OR SIB. FEELS THAT X.25 MAKES
IT BE EASIER TO GET IT INTO A BETTER STATE AND THAT IBM
WILL MOVE TO X.25. COMPOSERIE IS TRYING TO GET IT INTO A BETTER STATE
IN THIS VIEW.

0 CURRENTLY CONNECTING A TOTAL OF 100 HOSTS, A "FEW"
WITH X.25.

KEY TYMNET THINKS

- WHILE AN INITIAL LOOK AT TYMNET'S PERFORMANCE MAY BE IMPRESSIVE, THE SUPERFICIAL PICTURE WEAKENS UPON CLOSE ANALYSIS.
- REVENUES HAVE GROWN AT AN EXPLOSIVE 46% FROM 1979 TO 1982 AND CONTINUED IN 1983 TO ABOUT A 10% RATE.
- COMBINED REVENUES (AFFILIATED PLUS NON-AFFILIATED) HAVE GROWN AT AN AVERAGE 39.7% ANNUAL RATE, COMPARED FROM 6.4 MILLION IN 1979 TO 84 MILLION IN 1983.
- UNLIKE TELENET, TYMNET HAS ALWAYS REPORTED SOME LOSS, GIVING THEIR PERFORMANCE AN OBTUSE PICTURE.

THE BOTTOM LINE, HOWEVER, EXISTS A MORE PICTURE OF TYMNET'S PERFORMANCE.

NEW PAGE

TYMNET'S PROFITS

- TO BEGIN WITH, THE COMPANY'S PROFITS HAVE BEEN IN A DECLINING TREND SINCE 1979, CONTRASTING WITH THE EXPLOSIVE GROWTH IN REVENUES. THIS IS BECAUSE THE COMPANY'S PROFITS ARE PLACED ON TYMNET'S BALANCE SHEET, WHICH IS A LOSS OF PROFITS.
- PROFITS ARE ON AN OPERATING BASIS AS REPORTED, WHEN ADJUSTED FOR THE LOSS OF PROFITS ON A REVENUE - PROFIT BASIS, THEY DECLINE TO

LESS THAN HALF OF CORPORATE EELS, THAT IS
BELIEVED TO BE A DISCOUNTED ADJUSTMENT.
IF PLACED ON A FULL-TAXED BASIS (NOMINAL 47%
TAX RATE), THEY DECLINE EVEN FURTHER. IN 1983
FOR EXAMPLE CREDITED WITHIN AS 1.4% WAS
8.0%. WHEN ADJUSTED FOR CORPORATE EELS
- DROPPED TO 3.2%. IF TAXED AT AN 8% RATE
WAS, THEN WOULD BE A 2.6% NET AFTER TAX.

TYNNET INVESTMENT TRENDS

OF EQUAL SIGNIFICANCE IS TYNNET'S RAPIDLY GROWING
INVESTMENT IN NETWORK FACILITIES AND OTHER ASSETS.
THESE ACTIVITIES \$100 MILLION IN 1979, GROWING
AT A 52% COMPOUND RATE SINCE 1979.

NOTE THAT INVESTMENT GROWTH EXCEEDS REVENUE GROWTH
57% INVESTMENT VS 40% REVENUE. THIS INDICATES THAT OVER THE
LONG TERM THE COMPANY IS INVESTING MORE IN ITS
FACILITIES TO BE ABLE TO HANDLE INCREASING TRAFFIC.

EXPRESSED ANOTHER WAY, EACH TYNNET VAN DOLLAR
OF INVESTMENT PRODUCED \$1.96 IN REVENUE IN 1979.
BY 1983, EACH INVESTMENT DOLLAR PRODUCED \$0.93 IN
REVENUE IN 1983.

BY WAY OF COMMENT, THE TYNNET VAN ORIGINALLY "LOOKED"
LIKE A COMPUTING SERVICE BUSINESS. A YEAR OR TWO
LATER, HOWEVER, IT ADOPTED THE NAME OF ITS
WAY TO "LOOKING" LIKE A PURE COMMUNICATIONS BUSINESS,
I.E., IT IS GENERATING LESS THAN ONE DOLLAR IN
REVENUE FOR EACH DOLLAR OF INVESTMENT.

A SIGNIFICANT COMMENT IS THAT TYNNET IS
REGULATED AND THEREFORE THE NET IS
A REGULATED RATE OF RETURN. THE REGULATED
RATE OF RETURN IS SUCH THAT IT CANNOT
RAISE ITS RATES "AUTOMATICALLY" AS CAN A REG-ULATED
UTILITY. THIS IS THE MAIN REASON FOR THE REGULATORY SITUATION.

TYMNET TRAFFIC

1. DURING THE TREND IN TYMNET SESSIONS PER MONTH, SESSIONS HAVE GROWN AT AN AVERAGE RATE OF 15.9% PER YEAR. IT WILL BE NOTED THAT THAT IS APPROXIMATELY THE TOTAL REVENUE INCREASE ABOUT 1982.

2. LOOKING AT THE SESSIONS PER MONTH - THIS (TABLE) SHOWS THAT 1982-1983, THAT IS, ABOUT 30% INCREASE IN THE NUMBER OF SESSIONS PER MONTH.

3. REVENUE PER SESSION - TAXING SESSIONS (PER HOUR) IN 1982, INCREASED IN 1982, BUT IN 1983, THEN FELL SHARPLY IN 1983 -- 25.9% FROM 1982 LEVELS.

4. THE INCREASES THAT SEEM TO BE IN THE REVENUE PER HOUR (PER HOUR) IN 1982, BUT IN 1983, THEN FELL SHARPLY IN 1983.

5. THE INCREASE IN THE REVENUE PER HOUR AND ADMINISTRATION COSTS FOR THE NETWORK, INCREASED IN 1982, BUT IN 1983, THEN FELL SHARPLY IN 1983. NOTE THAT THE DECREASE OCCURRED DESPITE PRICE INCREASES* SPECULATIVELY, A PART OF THIS PHENOMENON MAY HAVE BEEN CAUSED BY A FURTHER SHIFT TO FASTER CIRCUITS.

* MEN 1982 PRICE INCREASE FROM \$3.40 HR TO \$4.25 HR IN 1982, OR 25% AND FROM \$0.04 TO \$0.05 PER X CHAR OR 25%.

FLORIDA BELL INTRA-LATA LADT SERVICE

- o THIS SERVICE APPROVED BY THE FLORIDA PSC
IN MAY 1983, OPERATIONAL OCTOBER 1983
- o ORIENTED TOWARDS:
 - VIDEOTEX
 - CREDIT CARD VERIFICATION
 - REMOTE METER READING
- o TRANSMISSION SERVICE UNDERLYING KNIGHT-RIDDER
VIDEOTEX IN MIAMI AREA (3 COUNTIES)
- o OFFERS 1200 bps dial-up synchronous UNDER
MEASURED AND BLOCK TIME ARRANGEMENT w/ T.O.D.
DISCOUNT.
 - USER PAYS \$1.08/hr extra for data (MEASURED)
 - \$900 VIDEOTEX TERMINAL REQUIRED
 - STANDARD TELEPHONE CHARGES APPLY
 - DIAL ACCESS
- o SEEK USE OF LATA AND SIMULTANEOUS VOICE THROUGH AN
"NOTE" VOICE OCCUPIES C. 20% PORTION OF CHANNEL, DATA
Goes on the other 80%. This is a significant improvement
over the previous system.
 - PORT CHARGE IS \$28.50/MONTH PLUS \$0.65/KILOPACKET
INCLUDING NOTE BOX LEASE.
 - STANDARD TELEPHONE CHARGES APPLY
- o LONG CONNECTION CHARGE IS \$2.00/MONTH FOR 100 Kbps AND
\$1.50 for 50 Kbps.
- o LADT IS A BELL LABS DEVELOPMENT NOW UNDER CONTROL OF
BCR. 1984 PLAN CALLS FOR DEPLOYMENT IN 30 MI. AREAS
BY 1990.
- o THIS SERVICE "FEEDS" THE 3B20D PACKET SWITCH
WHICH WESTERN ELECTRIC PRODUCED.

o LADT IS VERY INEXPENSIVE BUT IS LIMITED TO 2 SYNCHRONOUS SPEEDS 1.2 & 4.4.

o LADT DEPENDS ON LOCAL LOOP CHARACTERISTICS, CURRENTLY OPERABLE ON 87% OF LINES IN THE US. THE MAIN ELEMENT IS ABSENCE OF A BRANCH IN THE LOOP.

- THREE LOOP LENGTHS OF LESS THAN THREE MILES.

- REQUIRES LOOP MODIFICATION IN 10-20% OF METRO LOOPS NATIONWIDE.

o CURRENT REC PACKET-SWITCH ACTIVITY IS INADEQUATE TO THIS MONTH'S DEMANDS.

o UNDER A REGULATORY CLOUD OF "ENHANCED SERVICE" CLAIMS & COUNTER-CLAIMS AT THE FEDERAL LEVEL.

o WOULD REQUIRE SUBSTANTIAL TECHNICAL REVISION TO BE COMPATIBLE WITH "REAL WORLD" SPEEDS & PRACTICES.

o NOT A STARTER?

o IMPLICATIONS FOR GEISCO: PROBABLY NONE IN NEXT SEVERAL YEARS BUT THIS IS YET ANOTHER EXAMPLE OF MARKET FRAGMENTATION IN COMMUNICATION SERVICES.

Due Thursday
June 28th
by noon

BELL OPERATING COMPANIES

- 0 TEN BELL COMPANIES ARE CURRENTLY
UNDERGOING A PERIOD OF OPERATING
TERMINATIONS

THESE ARE:

PACIFIC TEL.	SOUTHERN BELL
NEW YORK TEL.	VERMONT TEL.
NEW JERSEY TEL.	WEST VIRGINIA TEL.
CONNECTICUT TEL.	MAINE TEL.
MASSACHUSETTS TEL.	NEW HAMPSHIRE TEL.

NINE ALL OF WHICH ARE CURRENTLY OWNERS OF THE
THAT REQUIRE FCC'S FOR "ENHANCED SERVICES."

THESE ARE PETITIONING FOR "ADDITIONAL ENHANCED SERVICES"
AND MUST BE ASKED FOR
- X.25 TO X.75
- X.25 TO X.75

- 0 RATIONALE IS ASYNC TO X.25 ALLOWS USE OF CURRENT
STANDARDS FOR USERS

- 0 X.25 TO X.75 PROVIDE EQUAL ACCESS TO CARRIERS - SUCH
AS USER WOULD OPERATIONAL SERVICES

THESE COMPANIES ARE CURRENTLY UNDERGOING A PERIOD OF
OPERATING TERMINATIONS ON AN FCC BASIS.

TELCO

THESE COMPANIES ARE CURRENTLY UNDERGOING A PERIOD OF
OPERATING TERMINATIONS ON AN FCC BASIS.

THESE COMPANIES ARE CURRENTLY UNDERGOING A PERIOD OF
OPERATING TERMINATIONS ON AN FCC BASIS.

SOUTHERN BELL

- 0 THEY WILL PROVIDE ONLY BASIC SERVICES, THEY WILL BE
PROHIBITED FROM PROVIDING ANY INTERMEDIATE TRANSMISSION
SERVICES (X.25).

- THESE WILL PROVIDE SERVICES
- SOMEONE WILL SELL THEM

- o HAS NOT YET PURCHASED INITIAL CONVERSION GEAR.

GENERAL IMPLICATIONS OF LDC MOVES

- o A SINGLE SALES FORCE CAN HANDLE BOTH CONVENTIONAL PRIVATE LINE AND MARKET.
- o CURRENTLY LIMITED TO INTRALATA TRAFFIC BUT WILL NOT STAY THAT WAY.
- o APPEARS INEXPENSIVE BUT WILL IT REALLY BE CHEAP END-TO-END INTRA-LATA AND NOT INTER-LATA?
- o IN THE CASE OF AT LEAST ONE COMPANY, NO RESEARCH HAS BEEN DONE ON THE AMOUNT OF INVESTMENT INVOLVED. THE ATTITUDE HERE SEEMS TO BE "PUT IT UP AND SEE HOW IT GOES."
- o THE EXPENDITURES FOR THESE NETWORKS ARE TINY COMPARED TO THEIR TOTAL \$1-2 BILLION ANNUAL CONSTRUCTION BUDGETS. IN TELCO TERMS THE INVESTMENT RISK IS MINIMAL.
- o THE ACTIONS OF THESE COMPANIES MAY TURN THE "LOCAL" VAN SEGMENT INTO A COMPOSITE OF LOCAL WITH INTERMIXED LOCAL & LONG Haul MARKET SEGMENTS, BUT NOT NECESSARILY.
- o ASYNC IS THE CURRENT FOCUS BUT THIS COULD LOGICALLY BE EXPANDED OVER TIME

IMPLICATIONS FOR GROUND

- THESE NETWORKS WILL GROW ONLY IF MARKET FORCES AND NOT POLICIES, BECAUSE EFFICIENT NETWORKS ULTIMATELY IS STILL AN ADVANTAGE
- CAN COSTS BE REDUCED BY EMPLOYING THESE NETWORKS AS A PART OF A TOTAL MANAGEMENT STRATEGY? CURRENTLY INFORMATION IS EXCESSIVE BUT THE ANSWER MAY BE YES
- THE LARGEST THREAT IS TO COMPETITIVE HIGH-TECH VENDOR. THEY HAVE SOMEWHAT TO LOSE, ALTHOUGH THE OPPOSITION BY TELENET, TRW, INC., IBM, ETC.
- WILL A NEW PLAYER PROVIDE A SIGNIFICANT "LONG HAUL" INTERNATIONAL PACKET TRANSMISSION AND COVERAGE OF UNPUBLISHED DATA? CURRENTLY THE ANSWER IS YES.
- CONNECTIVITY & ULTIMATELY ARE KEY VALUES OF NETWORKS. LOCAL PACKET DOES NOT DEFINE THIS. A COMBINATION DOES. SUCH A COMBINATION HAS BUSINESS VALUE FOR BOTH PARTIES.

~~INPUT BELIEVES THIS IS WORTH A PRELIMINARY INVESTIGATION.~~

HT&T COMMUNICATIONS

- AVAILABLE "VALUE-ADDED SERVICE IS BPSS - BASIC PACKET SWITCHING SERVICE OR ACCUNET PACKET SERVICE.
- AVAILABLE AT TWO RATES CURRENTLY 9.6 AND 56 Kbps
- NO PACKET ASSEMBLY OR DISASSEMBLY AVAILABLE BUT IS X.25 1980 PACKET INTERFACE.
- TWO BASIC CAPABILITIES:
 - VIRTUAL CALL CAPABILITY SETS UP & CLEARS CALLS AS MADE
 - PERMANENT VIRTUAL CALL THAT IS IN STATE OF A PACKET "PENDING LINK."
- ALSO PROVIDES CLOSED USER GROUPS, HUNT GROUPS OF UP TO 20 ACCESS LINES AND CAN HANDLE UP TO 1000 ADDRESSES PER ACCESS LINE.
- CAN CONNECT TO OTHER SYSTEMS VIA DDS.

CHARGES

PER 9.6 PORT \$850/MONTH PLUS \$500 INSTALLATION
PER 56.0 PORT \$1200/MONTH " " " "
PER 1000 PACKETS \$1.35
PER CALL SETUP \$0.0000

SUBJECT TO MINIMUM FEE OF \$365.00/MONTH FOR 9.6 AND \$1090/MONTH FOR 56 kbps port and a minimum of 3 months notice before discontinuation.

- CARRYING SERVICE FOR NET 1000.
- ACCESS LINE CHARGES & FIDS ARE EXTRA COST.



o BASIC ATTCOMM SERVICE... TO 'LET THE MARKET
HAVE THE SERVICE.' THEY WILL NOT BRING UP ISSUES
'AHEAD OF US'...

o THERE IS A PROBLEM THAT EXISTING PACKET SERVICES
ARE OF LOW QUALITY IN RESPECT TO THE CHAIN OF
AND SERVICE LEVELS. ...

o GOAL IS TO CREATE A "MESHED" NETWORK WITH
ALL SWITCHES INTERCONNECTED DIRECTLY TO ALL OTHER
SWITCHES. THIS APPROACH WILL BE TO ELIMINATE
MULTIPLE NODE HOPPING AND DELAYS, CUT
RE-TRANSMISSION,

o NEXT MOVE WILL BE TO SPEED UP THE NETWORK
DOWN TO 1000 MS. EXPECTED BY 1985

o THIS SERVICE WILL REMAIN PRIVATE TRANSMISSION
SUITABLE ONLY FOR THE MOST SENSITIVE USER.

o IS BPSS THE INTER-LATA DATA NETWORK
STANDARD OF THE FUTURE AS IT MAY WOULD
LIKE IT TO BE?



HT-15 NET 1000

1) GESTATION SINCE 1974, FIRST STATIONED PUBLICLY AS
"HCS - ALLIANCE" IN 1977. FOR
PROSECUTION IN 1978.

1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation

FURTHER DELAYS WERE ENCOUNTERED OVER THE LING
' UNDERLYING EPCO WILL REPORT ON THE PROGRESS

AS ORIGINALLY TARIFFED, MARCH 1945, THE NET
WAS 150% PER MONTH. THE NET WAS 150%
PER MONTH. THE NET WAS 150% PER MONTH.

THE UNIVERSITY OF CHICAGO

1. KINETIC STUDY OF THE REACTION OF 2,4-DINITROPHENOL WITH
 HYDROGEN PEROXIDE IN ACIDIC MEDIUM
 KPSS-TR-5

[illegible]

NET 1000 CONT'D

ORIGINALLY PLANNED AS THE "UNIVERSAL" APPROACH,
ALLOW LINKAGES BETWEEN DIVERSE TERMINAL TYPES
AND TO COVER 99% OF TERMINALS EXISTANT.

° STORAGE AND PROCESSING A NATURAL ADJUNCT TO
THIS APPROACH. NOW OFFERS:

- PACKET SWITCHING NET
- PROTOCOL CONVERSION
- "DATABASE MANAGEMENT" (IN COBOL)
- PRIMITIVE TIMESHARING (COBOL ONLY) FOR
APPLICATIONS DEVELOPMENT.

° SERVICE DIRECT FROM 17 CITIES, CURRENTLY SERVING
50-60 CUSTOMERS

° NATURE OF NETWORK INVOLVES "BIG" APPLICATIONS.
THIS IMPLIES LONG LEAD TIMES, EXTENSIVE DEVELOPMENT
AND (MOST PROBABLY) AN APPLICATIONS ORIENTATION

° WITHIN THE LAST YEAR ATTIS HAS ACCEPTED THE
CONCEPT OF "PARTNERING" WITH THIRD PARTIES
TO DEVELOP APPLICATIONS FOR THE NET. THIS IS
A COVERT ADMISSION THAT THEY CANNOT DEAL
WITH APPLICATIONS DEVELOPMENT THEMSELVES AND THAT
THEIR CUSTOMERS CANNOT LIVE WITHOUT. AS
A RESULT SEVERAL PARTNERSHIP OR TRIANGLE 3-WAY
RELATIONSHIPS ARE BEING DEVELOPED.

° NO NEW NETWORK CAPABILITIES HAVE BEEN
ANNOUNCED.
RELEASED SINCE THE JUNE 1982, NONE
ARE EXPECTED.

° PRICING REMAINS AS IT WAS IN JUNE 1982, A
PROBABLE INDICATION OF MARKET WEAKNESS. FURTHER,
ATTIS WILL NOT DISCUSS PRICING, SAYING THAT PRICES
ARE COMPLEX AND APPLICATION SPECIFIC.

ATTIS NET ALSO

o TO EXPAND THE NETWORK, ATTIS HAS HAD TO RELY ON VAN ACCESS.

o HAS NOW "KEYED" ON APPLICATIONS AREAS IN:

- FINANCE
- TRANSPORTATION

o TRANSPORTATION/TRUCKING.

- SHIPPING INFORMATION ACCESSED BY CUSTOMER FROM DATA PROVIDED BY SHIPPER
- ELECTRONIC PURCHASE ORDER MOVEMENT BETWEEN VENDOR/CUSTOMER
- SHIPPING STATUS AND MANIFEST INFORMATION DISTRIBUTION TO TERMINALS FROM SHIPPER'S HQ (FROM AND TO HOST).
- CURRENT CUSTOMER FOR THIS SERVICE IS ROADWAY EXPRESS (\$1.15B REVENUE, 11,900 EMPLOYMENT), A LONG HAUL TRUCKER.
- PARTIALLY REPLACED A PLANE NETWORK (MULTIDROP)

o FINANCIAL AREA HAS MORE RELEASSED APPLICATIONS

- NORWEST MORTGAGE HAS A MORTGAGE RATES/TERMS INQUIRY SYSTEM BASED ON THE MORTGAGE.
- DLW JONES INFORMATION SERVICE HAS AN ORDER ENTRY SYSTEM IMPLEMENTED. DJIS ALSO AVAILABLE.
- A POS TERMINAL FOR KROGER (1,800) HAS IMPLEMENTED CREDIT/DEBIT CARD AUTOMATICALLY

FROM THE UNITED STATES NATIONAL BANKING (UNION) THAT NET ALSO IS GENERATING REVENUE FROM ATTACHMENT TO ATTIS, PERHAPS AT A NET LOSS AND NOT MUCH COST SAVING TO THE CUSTOMER.

- IN ONE INSTANCE COST FOR TRANSPORTATION WAS \$100K - 2ND YEAR MORE FROM \$100K TO \$150K

o This is a strategic dilemma for AT&T, without
single application, they are not able to
move to the next level of "current state"
services to net 100

- The correct answer is to keep
moving

- All other applications to net 100
are not viable for those who are
cost insensitive (a small group)

o There are many other attempts to ~~be~~ be together
to create a new set of services. So far, no clear
successes.

o NET 100 is currently investigating the future of
cash and account as a network service.

o Seems heavily constrained by history, internal positioning,
organizational burdens, applications dependency but no
applications focus and limited development tools.

o Seven years after the initial announcement: "We're trying
to identify industries that need our capabilities."

o NET 100 may be viewed as a thresholding system for
which there are no pre-installed applications and no
development tools or programming tools.

o A new, open age of computing in a "deregulated" world

ATTIS NET 1000 PRICES (BASIC)

DIAL UP

SPEED	PRICE/HR
0-1200	\$4.20
1201-2400	6.60
2401-4800	9.60

PLUS \$1.75 KILOMETER

- NO DISCOUNT SCHEDULE BASED ON USAGE OR VOLUME
- NO OFF-Peak PRICING
- NO COMMITMENT OR "LOCK-TERMIN" ARRANGEMENTS

2000 HOUR CARRIER COMPARISON

		<u>ATTIS</u>	
TYMNET	\$7500	\$8400	- 12.0%
TELENET	\$7020 (4100)	\$8400	+ 19.7%

- PRICING BELIEVED TO NOT BE COMPETITIVE WITH MAJOR CARS.

→ - GENERALLY LACKS FLEXIBILITY AND OPTIONS PREVALENT WITH OTHER CARRIERS. A TARIFF MENTALITY LEGACY

- NO DISCOUNT SCHEDULE FOR PROCESSING OR STORAGE; STRAIGHT \$100.00/MEGABYTE PER MONTH AND \$0.02 PER ARJ.

→ - SINGLE RATE FOR "SUPPORT SERVICES". \$125.00/HR

CCMI

014502

11/1/83

\$185.50

INTERSTATE TRAVEL # 3



RECENT TELECOMMUNICATIONS INDUSTRY ENGAGEMENTS

• Specialized Processing Services for the Telephone Industry

• A STRATEGIC ANALYSIS BASED ON MARKET RESEARCH & VENDOR INTERVIEWS

• BUSINESS PLAN FOR PROCESSING SERVICES TO THE TELEPHONE INDUSTRY

• THE MARKET PLACE FOR TELEPHONE BILLING SYSTEMS WITH AN EMPHASIS ON LOCAL MEASURED SERVICE CAPABILITIES & SERVICES

• TELEPHONE COMPANY INFORMATION CENTER UTILIZATION; PRACTICES & PLANS WITH AN ESTIMATE OF CURRENT & FUTURE EXPENDITURES, SYSTEMS SOFTWARE AND PREFERRED INFO CENTER CAPABILITIES.

• DATA ANALYSIS OF TELEPHONE COMPANY DATA PROCESSING BY EXPENSES FUNCTIONAL CLASS, & COMPANY

• TELECOMMUNICATIONS MARKET ^{ASSESSMENT} ~~PLACE~~ ^{THE} FOR A BANKING INDUSTRY OF

• TELECOMMUNICATIONS MARKET ^{OF} ASSESSMENT FOR THE BROKERAGE INDUSTRY

• TELECOMMUNICATIONS MARKET ASSESSMENT OF THE COMPUTING SERVICES INDUSTRY.

• USER SATISFACTION ^{AND PLANNED UTILIZATION WITH} ~~BY ADVISOR AND~~ OF OTHER CARRIER SERVICES

• LONG TERM DEMAND FORECAST FOR KU BAND SATELLITE CAPACITY

• USER CHARACTERISTICS, SATISFACTIONS & PLANS FOR VALUE-ADDED NETWORK SERVICES.

• FINANCIAL MARKETING STRATEGIES & FINANCIAL IMPACTS OF VALUE ADDED NETWORKS.

• ^{SERVICE} ~~PRODUCT CHARACTERISTICS~~ OF A VIDEO TEX SERVICE CONFIGURATION: USER CHARACTERISTICS, SERVICE FEATURES & PRICING ALTERNATIVES

• INTERNATIONAL COMMUNICATIONS PRACTICES & SERVICES OF REMOTE COMPUTING FIRMS.

1985.5^h

Cellular Message Processing
Customer Accts Dept
(513) 397-4952

ART GILMAN
DIRECTOR OF CELLULAR

(513) 221-3439

BELL SOUTH REGIONAL BUDGET	193	= \$100MM	10
NEW ENGLAND TEL	4341	\$16.12	= 70MM 10
BELL PA		= 35	14
BELL MI	3,607	26.33	95 20
OHIO	2,883		10(?)
WIS	1475	30.51	45mm 45
ILL	4599	9.78	40-45 10.15
IND	1,373	29.13	40
NYTEL	8211	18.27	150
SNET	1511	29.78	45

2150

ALAN W. CRITES

JP STRATEGIC PLANNING & SYSTEMS INTEGRATION

MICHAEL J. CRITES

7/2/84
V-P/Mgr.'s Post
Filled by GEISCO

ROCKVILLE, Md. — General Electric Information Services Co. (GEISCO) has named Alan W. Crites vice-president and manager, strategic planning and operations integration, succeeding W. James McNermy, who was promoted earlier this year to senior vice-president software products operations.

Reporting to GEISCO chairman and president Walter W. Williams, Mr. Crites is responsible for the company's business development analysis functions.

Mr. Crites joined GEISCO in 1981 as manager, author marketing and has served as manager, general busi-

Intel Upgrades Real-Time OS

HILLSBORO, Ore. — Intel Corp. last week upgraded its iRMX 86 real-time operating systems with Release 6, a version which supports Intel's 188, 186 and 286 microprocessors and boards as well as systems based on those components.

Release 6 of the operating system continues to support the company's 8088 and 8086 microprocessors but adds support for the three newer microprocessors, the iSBC 88/XX, 186/XX and 286/10 board-level products and the 86/3XX and 286/3XX ness programs. Prior to being named vice-president and manager, strategic planning and operations integration, he was manager, financial services operation.

system-level products.

The iRMX OS has been sold as an option to Intel's OEM customers primarily in markets such as communications switching, process control, robotics and factory automation. Intel also makes available to its systems customers the Xenix implementation of the Unix operating system.

Intel said Release 6 will be available this month and will be licensed for an initial fee of \$6,000.

Release 6, stored on programmable read-only memories, also supports Intel's Multibus standards and can accommodate such Intel extension boards as peripheral controllers and bubble memories.

Anacomp Won't

INDIANAPOLIS — Anacomp will not make the interest payment of 13% per cent convertible.

The company said it expects to make the interest payment prior to the Aug. 14, 1984, expiration of the indenture's grace period.

At the same time, Anacomp reiterated its intention to make an offer to the debentures an offer to exchange the currently outstanding debentures for newly-issued securities. The offer, still incomplete, are to be made in the near future, the firm said.

In January, 1982, Anacomp issued \$50 million of the debentures, due Jan. 15, 2002, through a public offering of original outstanding debentures convertible into an aggregate

RACAL

To shorten your electronic design times, you can provide your project teams with Computer-aided Engineering, Design and Manufacturing systems. And those systems will do their individual jobs very well.

However.

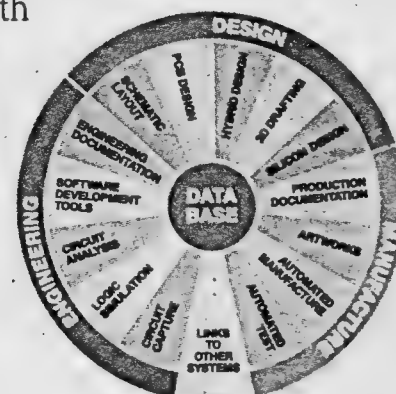
As soon as you try to transfer the data generated by your engineers to the design stage (not to mention manufacturing) you'll find you have a problem. Because none of the systems are fully compatible with each other. Engineering can't get along with Design. Design can't get along with Manufacturing. And vice versa. Worse still, when the systems can't get along, neither can the people using them. So instead of state-of-the-art, you end up with something akin to a state of war.

The solution, of course, is to work with one company that can handle the entire project from beginning to end. A company with a full range of modular systems for every stage of every electronic design project. All fully integrated around a common data base.

That company is Racal-Redac.

With Racal-Redac, you can solve today's problems without creating new problems for yourself tomorrow. Because all the system modules were designed to work together, and grow with you as your needs grow.

Read that last paragraph again. We at Racal-Redac are talking about a range of complete, totally integrated systems which work for you through every stage of the design cycle.



Finally, a totally integrated capability for electronics.





News

GTE Telenet Communications Corporation

8229 Boone Boulevard
Vienna, VA 22180

For more information: Claudia Houston 703/442-1934
After 6 p.m. 703/938-3283

April 12, 1984
FOR IMMEDIATE RELEASE

Summary: GTE Telenet design breakthroughs result in new packet switches, eight times more powerful than previously available models

VIENNA, VA, April 12 - - As a result of software and hardware design breakthroughs conceived by engineers at GTE Telenet Communications Corporation, the company today announced two new series of packet switching network processors capable of handling up to eight times as much data traffic as previous models.

Two of the engineers, Jeffrey A. Biber and Frank S. Yu, received the GTE 1984 Leslie H. Warner Technical Achievement Award for their design of the new Telenet Processor TP 4200, which can handle up to 1200 packets per second (pps), a capacity four times greater than previously achievable.

The TP 4200 utilizes a new central processing unit (CPU) with increased random access memory (RAM) and a new release of Telenet Processor Operating System (TPOS) software to attain the higher performance level. A second switch, known as the TP 4800, will employ two CPUs in an innovative design concept known as "co-processing," devised by the GTE Telenet development engineers. Co-processing technology enables the TP 4800 to handle traffic loads of up to 2400 pps.

-more-

Both switches can be interconnected using a new Local Area Network (LAN) technology, also developed by GTE Telenet, to furnish very high-capacity packet switch exchanges for use in dedicated networks supplied by the company.

Michael G. Vidnovic, vice-president for Product Operations at GTE Telenet, said the TP 4200 and 4800 series represent a "quantum leap in network processor design."

"Our technology will enable us to provide private network operators the ability to accomplish up to eight times as much work with a single switch. The end result will be that the customer can expand his network quickly to meet rising demand, but his costs will be only a fraction of the incremental capacity," he said.

Vidnovic said the new TP 4200 switches currently are being deployed in the nationwide Telenet network to increase capacity, performance and efficiency. "The TP 4200 enables us to continue providing the highest quality of service to our public network customers while holding the line against rising communication costs in this post-divestiture era," he explained.

He said that the first shipments of the TP 4800 are planned for the third quarter of 1984.

In a TP 4800, two CPUs divide the tasks that otherwise would be handled by a single CPU, including packet switching, internal housekeeping, accounting, configuration management, and network management. As a result, the TP 4800 packet switch can handle larger traffic loads than previous models.

Vidnovic noted that both the TP 4200 and TP 4800 are compatible with the company's existing TP 4000 hardware and software, and he stated that current models can be upgraded on site, without disrupting other network service areas.

He also announced the introduction of a new Packet Exchange Bus (PXB) that permits efficient interconnection of several co-located packet switches using 10 megabit LAN technology. "By combining the new packet switches with a PXB, we can furnish our customers very high-capacity packet switching exchanges with throughputs exceeding 10,000 packets per second and 2400 ports," Vidnovic said.

The PXB was designed using the IEEE 802.3 local area networking standard and functions as a high speed transmission path between several Telenet Processors in a packet switching exchange. It enables network planners to design the most cost-effective topology for the initial phases of a network and throughout the expansion phases to full implementation, since the PXB can be expanded in a modular fashion as more individual switches are added in an exchange.

Vidnovic said that "graceful growth" was an important design consideration for the PXB, the TP 4200 and the TP 4800.

"Growth is inevitable," he said. "Today, you may need a network to support 100,000 users. You don't want to build a network today that will be 99 percent idle for the next five years, but you don't want to have to turn away 99,000 users five years from now, either.

"We've designed systems that give network planners a convenient escape from this dilemma--they can build cost-effective networks today that meet the needs of today, and they can expand those networks as necessary to meet expanding requirements."

TP 4200 & TP 4800

Add 4

Part of the Diversified Services and Products Group, one of two major operating groups of GTE Corporation, GTE Telenet is a leading supplier of packet switching services and products worldwide. Currently, the Telenet public packet switching network in the United States is interconnected with 53 offshore locations, both through GTE Telenet-provided direct links and through interconnection with facilities provided by other international record carriers. The company also provides dedicated packet switching networks to large organizations, multi-national corporations and the telecommunication agencies of other countries.

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News

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After 6 P.M. (703/938-3283)

April 12, 1984
FOR IMMEDIATE RELEASE

Summary: GTE Telenet wins British Telecom contract; will supply new high-speed packet switch

VIENNA, Va., April 12--GTE Telenet Communications Corp., through its European distributor Plessey Controls, Ltd., has been selected by British Telecom as the supplier of hardware and software for a major expansion of the United Kingdom's public data network, Packet Switch Stream (PSS) service.

The total value of the contract is estimated at £22.5 million (approximately \$30 million) over the next two years.

According to Paolo Guidi, vice president and general manager of GTE Telenet's Network Systems and International Services business unit, the contract calls for nearly quadrupling the size of the existing PSS network over the next two to three years.

-more-



He explained that the design breakthrough achieved by GTE Telenet will allow BT to obtain state-of-the-art, cost-effective technology capable of fulfilling users' requirements over an extended range of capacity and performance targets.

Furthermore, GTE Telenet will supply, as part of this contract, a recently announced Packet Exchange Bus (PXB), based on Local Area Network technology, which will extend the operational range of the co-Processor switching unit, adding considerable flexibility to quickly meet rising demand.

Guidi noted that the new co-Processor based switching units are compatible with existing equipment in PSS, originally supplied by GTE Telenet and Plessey.

"I feel that British Telecom's selection of GTE Telenet and Plessey is a reaffirmation of their original choice," he said, "and it represents their expectations for explosive growth in packet switching communications."

Part of the Diversified Products and Services Group, one of two major operating groups of GTE Corp., GTE Telenet is a leading supplier of packet switching network services and products worldwide. The company supplies dedicated network systems to large organizations, multinational corporations and the telecommunications authorities in other countries. Since 1979, the company has installed more than 50 such networks worldwide.

GTE Telenet's U.S. operations include the national Telenet public data network; the TELEMAIL electronic mail service for professionals and business managers; the MINET medical information network for practicing physicians; and the FINET stock quote information service for banks, savings and loan institutions and financial advisors.



News

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Ron Williams 202/638-1200

May 15, 1984
For Immediate Release

Summary: GTE Telenet introduces technological breakthrough in electronic mail security system

WASHINGTON, May 15 -- A new software package for data security using public key encryption algorithms will allow computer users to protect confidential electronic messages, a leading international telecommunications firm announced today.

GTE Telenet Communications Corporation introduced the Phasor Code Encryption System designed specifically to provide maximum security for users of GTE Telenet's Telemail electronic mail service.

"There is no foolproof security system, but Phasor Code employs a complex mathematical code that makes it nearly impossible to intercept messages from the system," says Joseph J. Porfeli, vice president and general manager for GTE Telenet's Network Applications and Terminals business unit.

(more)



Phasor Code is different from traditional security systems because it uses a public key system. Two distinct "keys" are used to encrypt and decrypt confidential messages. The public encryption key is like a phone number -- it's available to all members on the network, Porfeli explains.

The decryption key is secret and allows the intended information receiver to unscramble the message. Keys can be exchanged electronically instead of physically as with conventional security systems, he says.

To send a private message, the sender simply looks up the recipient's public code in a directory and uses it to scramble the information into an insoluble mathematical formula. The recipient then descrambles the message with the secret decryption key.

A breakthrough in encryption technology developed by International Phasor Telecom LTD, in Vancouver, British Columbia, Phasor Code provides a level of maximum protection for sensitive electronic mail messages using a proprietary encryption algorithm. Custom encryption algorithms are also available, Porfeli says.

Written in PASCAL and ASSEMBLER for the microcomputer systems using MS DOS/PC DOS, Phasor Code requires 128 KB (128,000 bytes) of memory and operates on all IBM standard disks.

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News

GTE Telenet Communications Corporation

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After 6 p.m. 703/938-3283

January 17, 1984
FOR IMMEDIATE RELEASE

SUMMARY: GTE Telenet and British Telecom announce first packet switching access to telex in U.K.; eliminates special equipment.

VIENNA, Va., Jan. 17 -- GTE Telenet Communications and British Telecom today announced the availability of a faster and more economical way to transmit telex messages which eliminates special, dedicated equipment.

Called "Interstream One," the new service enables subscribers of the companies' public packet switching networks to send messages to any telex in the United Kingdom using standard data terminals, personal computers or word processors.

This is the first service of its type anywhere in the world.

"Most people don't count the steps to the telex machine, but in a typical office building, those steps can add up very quickly and can cause delays in time-critical communications," said Paolo Guidi, vice president and general manager for GTE Telenet's Network Systems and International Services unit. "With Interstream One, business people can send telexes directly to the United Kingdom from their desktop personal computers or data terminals."

- more -



Telex
Ad 1

According to Guidi, the cost savings is substantial. Standard telex rates to the United Kingdom are between \$2 and \$3 per minute. "Interstream One rates," he said, "Can be as low as 17 cents per minute and 8 cents for every 400 characters transmitted."

Guidi said that subscribers to GTE Telenet's public data network and Telemail electronic mail service can begin using Interstream One immediately. All Interstream One messages originating in the United States will be billed directly to senders' regular Telenet accounts.

Access to Interstream One is gained through interconnections between the telex network and British Telecom's PSS packet switching network in the United Kingdom and between PSS and the Telenet network in the United States.

Part of the Diversified Products and Services Group, GTE Telenet is a leading supplier of packet switching network services and products worldwide.

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News

**GTE Telenet Communications
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After 6 p.m. 703/938-3283

February 13, 1984

FOR IMMEDIATE RELEASE

SUMMARY: GTE Telenet introduces Micro-Fone II, new version of
popular transaction terminal

VIENNA, Va., Feb 13 -- GTE Telenet Communications Corp. today
announced the introduction of its Micro-Fone II transaction pro-
cessing terminal, a second-generation transaction terminal.

According to Joseph J. Porfeli, vice president and general
manager for GTE Telenet's Network Applications and Terminals
unit, the Micro-Fone II offers users a number of unique new
features, making it one of the most useful and versatile of all
transaction terminals currently available.

- more -

Ad 1

Micro-Fone II

"The Micro-Fone II was designed to handle any number of inquiry-response applications, including payroll reporting, order entry, data capture and social services benefits distribution -- even electronic messaging using our Telemail electronic mail service. Although we have added significantly to the terminal's technical capabilities in this version, we have gone to great lengths not to sacrifice the reliability and ease-of-use which have made our terminal so successful to date," Porfeli said.

Some of the Micro-Fone II's new features include plug-compatible ports for auxiliary devices like printers and Personal Identification Number (PIN) pads; remote programming for reading or loading information from a distant location; data capture for storing data at the point of inquiry; automatic data-to-voice switching enabling a central computer to switch a data transaction to a voice call; data protection features that assist in safeguarding sensitive information; and programmable prompt messages for tailoring special applications.

Since its initial introduction in 1981, the Micro-Fone has been widely used in retail establishments for credit card authorization and check guarantee and in financial institutions as a low-cost teller terminal.

-more-

Ad 2

Micro-Fone II

In a typical retail application, a merchant simply passes his customer's credit card through the magnetic stripe reader, types in the amount of the transaction, and with the push of a button transmits the purchaser's credit card number and total purchase amount to the credit issuer's host computer system. In seconds, the Micro-Fone displays to the operator a brief message indicating whether or not the purchase is authorized.

Part of the Diversified Products and Services Group, one of two principal operating groups of GTE Corp., GTE Telenet is a leading supplier of packet switching services and products. The company's Network Applications and Terminals business unit operates the Telemail electronic mail service for managers and professionals, the MINET medical information and communication service for practicing physicians, the FINET stock quote information service for banks and savings and loan institutions, and the Micro-Fone II transaction processing terminal.

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News

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or
Ron Williams 202/638-1200

March 27, 1984
FOR IMMEDIATE RELEASE

Summary: GTE Telenet introduces first electronic news service
for doctors

NEW YORK, March 27 -- Now doctors have a new electronic tool to assist in providing the best patient care possible while keeping up with fast-paced breakthroughs in medicine, a leading international telecommunications firm announced today.

GTE Telenet Communications Corporation and Fisher Stevens Inc. introduced PHYCOM (Physician Communications) service, the first online version of the familiar Physicians' Desk Reference^R (PDR) and other timely medical news for doctors.

Going on line in early April, PHYCOM will offer information on the latest pharmaceutical developments and other practice-related news, says Joseph J. Porfeli, vice president and general manager for GTE Telenet's Network Applications and Terminals business unit. PHYCOM is only available through GTE Telenet's MINET medical information network.

"PHYCOM contains a wealth of information and a treasure trove of capabilities for the busy doctor," Porfeli says.

(more)



PHYCOM, p. 2

PHYCOM contains the Physicians' Desk Reference^R, published by Medical Economics Company Inc., through which physicians will be able to access complete prescribing information for nearly 1,000 trade name pharmaceutical products by the end of April. The service also includes product profiles, information on patient reactions, abstracts of papers by other physicians with prescribing experience, and a bibliography of clinical studies.

"Most of this information is free of charge to the doctor, since the costs of providing the service are shared by the sponsoring pharmaceutical companies," Porfeli says.

PHYCOM also provides free daily news bulletins from the Bureau of National Affairs on medical, regulatory, and practice-related developments, with special emphasis on government health care rulings and medico-legal decisions.

An electronic request service enables doctors using PHYCOM to contact sponsoring drug companies day or night to request product literature or samples, order reprints of published papers, or register for company-sponsored continuing medical education (CME) seminars and symposia, the telecommunications executive says.

Porfeli says PHYCOM is exceptionally easy to use. "Physicians are and always will be physicians first. They will be computer users only as the use of computers supports their primary interest -- providing high-quality patient care. GTE Telenet and Fisher Stevens have designed PHYCOM with that truth foremost," he says.

(more)

According to Porfeli, even a novice computer user can learn how to use PHYCOM in just a few minutes. A doctor simply hooks up his data terminal or personal computer to the telephone and completes a simple connect sequence using the Telenet public data network. Once connected, PHYCOM actually leads the physician to the desired information or service through a series of simple English prompts and "menu" choices.

PHYCOM was developed jointly by GTE Telenet, the Vienna, Va.-based supplier of advanced computer communications services and systems worldwide, and Fisher Stevens Inc., a well-known Totowa, N.J. firm specializing in pharmaceutical marketing. GTE Telenet is part of the Diversified Products and Services Group, one of two major operating groups of GTE. Fisher Stevens is a wholly owned subsidiary of the Bureau of National Affairs.

The PHYCOM project was sponsored by a number of leading pharmaceutical companies. Initial charter subscription sponsors include Ayerst International Inc., a division of American Home Products Corp.; Burroughs Wellcome Co.; Lederle Laboratories, a division of American Cyanamid Co.; Smith Kline & French Laboratories, a division of SmithKline Beckman Corp.; and USV Laboratories.

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